

SHRUBS OF MICHIGAN

CECIL BILLINGTON



CRANBROOK INSTITUTE OF SCIENCE

Bulletin No. 20

December, 1943

COPYRIGHT 1943
BY THE CRANBROOK INSTITUTE OF SCIENCE
BLOOMFIELD HILLS, MICHIGAN

PRINTED BY *The Cranbrook Press*, BLOOMFIELD HILLS, MICHIGAN, U. S. A.

Contents

Preface	5
Introduction	7
Identifications	11
Shrubs and the conservation of wildlife	13
Collecting	16
Ecological	20
Distribution	23
Rare or infrequent species	24
Plant names and their authors	27
The form and structure of shrubs	32
Keys to the genera of Michigan shrubs	43
The shrubs of Michigan	49
Glossary	233
Bibliography	239
Index	242

Preface

When the Director of the Cranbrook Institute of Science, Dr. Robert T. Hatt, assigned to me the task of compiling a work on the shrubs of Michigan as one in the series of popular bulletins to be published by the Institute he doubtless had in mind that a layman can best write for laymen. Be that as it may this book has been prepared with the idea that it will be most useful to those who cannot be professional botanists, but who have the taste and desire to observe and enjoy the beauties which nature has distributed about us and which are so abundantly represented by the shrubs. Technical terms have been used, but the writer has had in mind the oft-repeated statement of various friends who have said that their interest in higher education cooled completely when they reached botany with its aggregation of seemingly meaningless and unpronounceable words. It is quite impossible to describe the various parts of plants without using the names which have been assigned to them in general usage. The apparent difficulty of these will disappear with a little close study.

To those who desire to go beyond the range of this little volume in the study of shrubs or other forms of plant life a great variety of material is available. In seeking to make this bulletin popular, scientific accuracy has not been sacrificed, but a consistent effort has been made to give the reader the most precise information possible concerning the shrubs of Michigan expressed in relatively simple terms.

CECIL BILLINGTON

Bloomfield Hills, Michigan
September 1, 1942

Shrubs of Michigan

By CECIL BILLINGTON

Introduction

The first step in compiling this bulletin on the shrubs of Michigan consisted in ascertaining the proper definition of a shrub. To do a job it is necessary to know what the job is.

On first thought it seems easy to define a shrub. Shrubs are all about us, along the roads, in the woods and planted for ornamental purposes around our homes. Various sources were consulted from which the following are quoted:

"A woody perennial plant smaller than a tree. The line of demarcation between shrub and tree in the matter of size is somewhat indeterminate; but if the plant is a vine, or if it is a bush, that is, consists of a number of small stems from the ground or branches from near the ground, it is called by botanists a shrub. In popular language a shrub is a bush."—*New Standard Dictionary*, Funk and Wagnalls.

"The line between shrubs and trees is not very definite. A shrub generally has a number of stems springing from the ground and a tree usually has a single trunk, but this is not uniformly true in either case."—*Cyclopedia of American Horticulture*, Bailey.

"A shrub generally has several stems from the same root, or a single crooked or leaning stem, not large enough for a fence post, and seldom more than three inches in diameter. Shrubs are as a rule most abundant in poorer soils; and they usually grow slowly or are much shorter-lived than trees."—*Economic Botany of Alabama*, Harper.

"Shrubs are woody plants of bushy habit in varying sizes, developing several stems instead of a single trunk as does a tree."—*The Garden Encyclopedia*.

"Shrub. A woody perennial, smaller than a tree, usually with several stems."—*Gray's Manual of Botany*, Seventh Edition.

"Shrub. A woody plant usually less than 20 feet high and generally with several stems from a common base."—*Trees and Shrubs of Minnesota*, Rosendahl and Butters.

The definitions are fairly well in agreement, but I know of one soft maple, which in no sense could be defined as a shrub, having nine trunks some of which are at least a foot in diameter, all springing from one common center, at the ground. Multiple trunk trees are by no means uncommon, particularly in second growth areas, and there are many instances where ordinary shrubs have grown far beyond anything usually thought of as a shrub. I have seen on Cranbrook old staghorn sumacs from fifteen to twenty feet tall and with trunks nine inches in diameter at the base, and seven inches in diameter three feet from the ground.

Nature being what it is, however, there seems to be nothing we can do but make our writings fit the circumstances as they exist, and in this bulletin an average definition has been attempted; only those plants which are regularly and popularly regarded as shrubs being included. But even this needs some qualification, for after consideration it was decided to include the woody vines. There are not many of them and they answer all the specifications for shrubs with the one exception that they require some form of support. One would have no hesitation in including poison ivy as a shrub, and yet it might with equal reason be classed as a vine. When a fence post or a tree is convenient it acts as a vine and climbs, sometimes to considerable heights. Lacking such support it does not trail on the ground as a grape vine might do, but grows in regulation shrub-like form.

Our list of native vines includes two which are somewhat woody but which usually freeze back during the winter. These, *Menispermum canadense* L. and *Clematis virginiana* L., are not included. *Solanum Dulcamara* L. is rated as a vine in our manuals, but it also freezes back and for that reason is omitted. *Decodon verticillatus* (L.) Ell., a perennial herb or slightly shrubby plant, which is sometimes listed as a shrub has not been included for the same reason. It grows in swampy grounds and may often be found bordering small ponds. Dwarf Mistletoe, *Arceuthobium pusillum* Peck, a very dwarf woody plant, parasitic on conifers is found in the northern part of the state, but is excluded for the reason that it fails to meet the accepted definition of a shrub. *Chiogenes hispida* (L.) T. & G., a trailing and creeping evergreen with very slender and scarcely woody stems, is treated as a shrub by some. It is omitted here, however, for the same reason that Dwarf Mistletoe is not included.

While the position of the shrub may be secondary to that of the tree, it none the less occupies a very important place. A great deal of the beauty which meets our eyes as we drive about the country is derived from the shrubs. They are everywhere along our roadsides and streams. Sometimes they are regarded as a nuisance and if given a chance some

species will quickly take possession of an abandoned field to the exclusion of practically everything else.

Our native shrubs bear flowers in myriad forms and colors; some in bold panicles, others in delicate racemes and some singly. These are followed by an equally interesting and colorful assortment of fruits ranging from the delicate translucent red berry of the yew, the pale blue berries of the silky dogwood and the huckleberries to the dry flat seeds of the wafer ash, the greatly inflated pods of the bladder nut and the pyramidal red bobs of the staghorn sumac. Many of these fruits remain on the shrubs until far into the winter, furnishing a bright and interesting note in a generally drab landscape.

The leaves of our shrubs are equally interesting to the student and the nature lover. They run the gamut of botanical descriptions from those of the yew, which are thin and narrow, the juniper, still narrower with tips as sharp as needles, to the compound leaves of the prickly ash, the elder and the sumac. In the autumn these same leaves add their quota of beauty to the landscape. The autumnal coloring of the sumacs is particularly noteworthy and there is scarcely a more beautiful sight than a swamp of poison sumac after the first frost in the fall. The leaves take on a brilliant scarlet and crimson hue brightened with yellow and orange—an irresistible beauty to many unsuspecting persons who gather the leaves for decorations, only later to find themselves afflicted with a most severe case of poisoning.

The beauty of our native shrubs does not entirely disappear with the leaves. In the leafless season a mass of shrubbery is enveloped in a hazy mist and exhibits many interesting patterns of form and color adding much of beauty to the winter landscape. Although less brilliant than the flowers and leaves, the bark of our native shrubs exhibits a wide range of colors. From the yellow and green of the willows, which gleam in the winter sunshine, to the dark red of the red-osier dogwood which becomes a bright purplish-red when the cold weather comes, there are myriads of shades and tints. In March and early April the twigs of the red-osier, anticipating the return of spring and the growing season, become bright red and glow in the increasing sunshine.

It would be strange indeed if in a group as numerous as our native shrubs there should not be found a few freaks and renegade members. In the former class may be mentioned the witch-hazel which, reversing the usual procedure, blooms in the autumn at the moment its leaves are falling. The flower buds appear in August, expand in October and November giving to the shrub the aspect of April. Then there is the leatherwood, or moosewood, a peculiarity of which is its thick, porous

bark. This is soft and pliant, yet its tenacity and toughness are astonishing. It is practically impossible to separate a limb from the bush with unaided hands. Its fibers furnish a wonderful example of natural string, and the Indians used it for bow strings, fish lines and in the manufacture of baskets. The renegades are the two prominent nuisances, poison ivy and poison sumac.

Poison sumac is our most poisonous plant. Its juices are extremely dangerous to some persons, who cannot even pass the bush with impunity, while others enjoy a complete immunity. It is hazardous to experiment with it recklessly. The poison shows itself in long continued swellings upon the surface of the body and many will attest their painful nature. Poison ivy is a woody vine climbing by numerous aerial rootlets, the stem sometimes two or three inches in diameter. It climbs trees and fence posts, lacking which it assumes a shrubby growth. It grows in too great abundance throughout Michigan, and instead of becoming extinct, partly because of its general immunity from disturbance, it is increasing. Unlike poison sumac, which grows only in very wet places where it can be avoided by the majority of people, poison ivy is found in every situation, too frequently where it is not wanted.

The shrubs, perhaps, do not have as many ingenious ways of dispersing their seeds as the herbaceous plants, but a number of the different methods are represented. For example, the witch-hazel ripens its last year's nutlets at the time it blooms in October, and finally sends them out from their woody pods with a projectile force which carries them several yards. The thin, nearly round seeds of the wafer ash are wind-borne and young shrubs spring up in great profusion in the vicinity of the parent bush. Other shrubs depend upon the birds to broaden their distribution.

In holding the fallen leaves in place in our woods the shrub performs a great economic service; it aids in transforming them into humus, an indispensable part of fertile soil, and conserves the water supply.

In addition to the many merely interesting attributes of our shrubs it is only fair to mention some of their more utilitarian uses. The juniper, willow, witch-hazel, sumacs, wintergreen and viburnums are used in medicines and the industries, while those whose fruit is used as food include the following: huckleberries and blueberries, elderberry, raspberries, blackberries, plums, viburnums and the hazelnut. Our native shrubs also include many species which are extensively planted as ornamentals in landscaping. In this class may be mentioned the yew, juniper, willow, alder, spice bush, witch-hazel, nine-bark, spiraea, roses, cherries, sumacs, bittersweet, bladder nut, dogwoods, buttonbush, viburnums and elders.

It would be possible to go on indefinitely enumerating interesting features concerning the majority of our shrubs. In most cases as far as practicable these will be mentioned in connection with each species, and it is hoped that the foregoing will serve to instill in the reader the necessary interest and curiosity to cause him to go further in the study of this most interesting group of our native plants.

In writing the descriptions in this bulletin technical terms of the parts of flowers have been used, but the descriptions have not been carried quite as far as in the professional manuals. Such terms as are included have been used advisedly. In many cases they could have been translated into common language, which the glossary attempts to do. However, if the beginner wishes to carry on the study here begun it will be necessary to master these terms sooner or later, and in this as in other things there is no time like the present.

This bulletin is not intended as a catalog of every species of shrub which has been described from Michigan. Its primary purpose is to awaken and stimulate an interest in our native flora and create a desire to know more about it, and to seek such information in the many books and manuals available.

Identifications—To aid in quickly locating a shrub, keys, simplified as much as possible, have been provided. Only characters which are present during the normal summer season on mature specimens are used. For those who wish to study the shrubs in winter, books giving keys based on winter characters are obtainable. As this bulletin is primarily intended for the amateur a few words of instruction in the use of keys may be helpful.

To the extent possible those characters which stand out and tend to catch the eye are used. Two alternatives are given, either a character is or is not present. In the keys the two opposed characters are given the same number. The following will serve as a simple illustration:

1. Leaves linear or scale-like, persistent
 2. Leaves flat, sharp-pointed, not over 2 mm. wide, green beneath.....*Taxus*
 2. Leaves in whorls of three, needle-like, with a white line beneath.....*Juniperus*
1. Leaves not linear or scale like, deciduous.
 3. Leaves simple
 4. Margins entire
 5. Leaves more or less dotted, sepals and petals 5.....*Hypericum*
 4. Margins not entire, etc. etc.
 3. Leaves compound, etc. etc.

To use the keys let us suppose several branches of shrubs, which it is desired to identify, have been gathered. With the specimens in hand reference is made to the key to the genera. The first division calls for linear leaves. The shrub selected has simple leaves of moderate size,

oblong to oblanceolate in shape. Obviously it does not belong under the first classification. Upon closer examination it is found that the margin of the leaves is entire, not notched, and that they are more or less dotted with small black spots. The next step is the examination of the flowers and it is found that the sepals and petals are five in number which leads to the genus *Hypericum*. If the leaves had been linear, or scale-like the shrub would have come under the first division and the process would have been the same.

After determining the genus the next step is to turn to the page indicated and in the same manner determine the species. In constructing the keys it is literally impossible not to use botanical terms. To aid in their understanding and render identification easier explanatory illustrations and a glossary of terms have been appended. These should be consulted whenever in doubt as to the meaning of a word or phrase.

Accurate observation of the structure in question and correct interpretation of descriptive terms is essential to the successful working of the keys. The beginner is bound to encounter difficulties no matter how carefully he works. Nature is scarcely ever exactly twice alike and there will be difficulty in deciding how much of any character a given phrase signifies. However, when once a general insight is gained these questions disappear and the study of shrubs or any branch of our native flora becomes an absorbing pastime.

A small hand lens will be found exceedingly helpful in the work of identification. One with magnifying powers of 8-12 diameters is sufficient. Several makes are available.

The keys to the genera used herein have been patterned after the very efficient and easily workable 'Keys to Woody Plants' by W. C. Muenscher, published in 1936, the author having given his permission to so use them.

Among the shrubs are a number of genera which are very difficult even for the professional botanist. These include the willows, which hybridize naturally, making the determination of the different species very difficult; the raspberries, roses and the hawthorns or *Crataegus*. The most the amateur can hope to do is to know the marked types of these genera. Many species, varieties and forms which have been named in each of these groups will not be included in this bulletin. In the event the student wishes to pursue his study of one or more of these genera beyond the scope of this work, there are in addition to the manuals, monographs which may be obtained for the purpose. Investigators in these special fields are continually bringing out new works and almost any university or college can supply an up to date bibliography.

Shrubs and the Conservation of Wildlife—A volume dealing with our native shrubs would hardly be complete if it failed to mention their usefulness in conserving our wildlife. Our streams are usually lined with shrubs which anchor the banks and shade the waters, conditions upon which much of the fish life and its food is dependent. Food and shelter are first essentials in conservation of land animals, and shrubs are one of the most important elements in providing these essentials. They constitute the cover for wildlife, both bird and mammal, which corresponds to barns and sheds for domestic animals; they afford shelter from the elements and refuge from enemies, not to mention food of a variety of classes including browse, mast, fruit and seed. Places to feed, hide, rest, sleep, play and raise young have been specified as constituent parts of habitable range. Shrubs forming low thickets are invaluable for the protection of quail, pheasants and other ground birds, and vines in combination with shrubs give extra security to these same birds. Without cover wildlife cannot remain on an area, and there is abundant reward for leaving patches of shrubs in fence rows or other convenient places, for the farm with some shrubbery, greenery and wildlife is a much more satisfactory place on which to live than one completely devoid of such life.

It is desirable that cover plants produce food as well as shelter. Wild grapevines, plums and haws are outstanding in this respect, and under winter conditions the mechanical protection offered by a thorny bush or a dense tangle of grapevines often represents the only chance quail or other ground birds have of dodging their enemies. Almost any farmer can testify that these are easy to grow in fence rows or on other waste lands.

So far in this discussion of shrubs in relation to conservation of our wildlife the emphasis has been upon the broader areas of farm lands and the preservation of our native shrubs as cover for ground birds and animals. There is another division of our wildlife which is attractive and valuable equally to the farm and city dweller. Reference is here made to the smaller non-game or song birds. The economic value of these birds has long been recognized. The song birds are not only beautiful in themselves, but they help to maintain the beauty of our ornamental shrubs, trees and vines by feeding on destructive insects. In doing landscape planting about our homes the dual purpose of beautifying the grounds and attracting the birds should be borne in mind. The selection of plants should be made discriminately so that they will not only add to the beauty of the premises, but will also provide food and cover for the birds. A variety should be planted to avoid monotony and give a

diversity of fruits over the longest possible period. Shrubs, trees and vines should be planted for summer flowering and for autumn fruiting, selecting some species which will hold their fruit through the winter. To attract the widest variety of birds it is necessary to have shrubs and trees which appeal to the seed-eating as well as those for the fruit-eating species.

In commenting upon the individual shrubs reference has been made in some cases to their value from an avian standpoint. However, many of the native shrubs do not take kindly to cultivation and, while their fruits make splendid food for the birds they cannot readily be used in landscaping. In the following list some shrubs sold by nurseries and not native of Michigan have been included. They are primarily for landscape planting, but many of them will naturalize readily and fit appropriately into the native scene. No attempt is here made to offer suggestions for ornamental planting. In order to be successful shrubs or other plants must be situated in suitable habitats. Nurserymen or landscape architects can advise in this respect. It is probable that the fruits, berries and seeds of wild plants are more relished by the birds than those of cultivated varieties and they should be used whenever possible.

The plants here listed are given in alphabetical order by genera and without descriptions simply to serve as a guide in the selection of materials for an ornamental or naturalized planting attractive to our native birds. The United States Fish and Wildlife Service (Biological Survey) and the United States Bureau of Plant Industry have made extensive investigations of this entire subject and have literature available upon request.

Acer pennsylvanicum, Striped Maple

Acer spicatum, Mountain Maple

Alnus incana, Speckled Alder

Amelanchier oblongifolia, Shad-bush

Amelanchier spicata, Low Juneberry

Aralia spinosa, Hercules' Club

Arctostaphylos Uva-ursi, Bearberry

Benzoïn aestivale, Spice Bush

Berberis japonica, Japanese Barberry

Berberis thunbergii, Thunberg's
Barberry

Berberis vulgaris, Common Barberry

Betula glandulosa, Dwarf Birch

Betula pumila, Swamp Birch

Celastrus scandens, Climbing

Bittersweet

Cornus alternifolia, Alternate-leaved
Dogwood

Cornus Amomum, Silky Cornel

Cornus asperifolia, Rough-leaved
Dogwood

Cornus Baileyi, Bailey's Dogwood

Cornus circinata, Round-leaved
Dogwood

Cornus paniculata, Panicked Dogwood

Cornus stolonifera, Red-osier
Dogwood

Crataegus Crus-gali, Cock-spur Thorn

Crataegus mollis, Red-fruited Thorn

Crataegus punctata, Large-fruited
Thorn

Empetrum nigrum, Black Crowberry

- Evonymus americanus*, Strawberry Bush
Evonymus atropurpureus, Burning Bush
Evonymus obovatus, Running Strawberry Bush
Gaultheria procumbens, Teaberry, Checkerberry
Gaylussacia baccata, Black Huckleberry
Gaylussacia frondosa, Blue Tangle, Dangleberry
Ilex verticillata, Winterberry
Juniperus communis var. *depressa*, Prostrate Juniper
Juniperus horizontalis, Creeping Juniper
Lonicera canadensis, American Fly Honeysuckle
Lonicera dioica, Smooth-leaved Honeysuckle
Lonicera glaucescens, Douglas' Honeysuckle
Lonicera hirsuta, Hairy Honeysuckle
Lonicera involucrata, Involved Fly Honeysuckle
Lonicera oblongifolia, Swamp Fly Honeysuckle
Mitchella repens, Partridge Berry
Myrica cerifera, Wax Myrtle
Myrica Gale, Sweet Gale
Prunus americana, Wild Yellow Plum
Prunus cuneata, Appalachian Cherry
Prunus nigra, Wild Plum
Prunus pumila, Sand Cherry
Prunus virginiana, Choke Cherry
Pseodera quinquefolia, Virginia Creeper
Pseodera vitacea, False Grape
Ptelea trifoliata, Shrubby Trefoil
Pyrus arbutifolia var. *atropurpurea*, Red Chokeberry
Pyrus melanocarpa, Black Chokeberry
Quercus prinoides, Shrub Oak
Rhamnus alnifolia, Alder Buckthorn
Rhamnus caroliniana, Indian Cherry
Rhus canadensis, Fragrant Sumac
Rhus copallina, Dwarf Sumac
Rhus glabra, Smooth Sumac
Rhus typhina, Staghorn Sumac
Ribes oxycanthoides, Northern Gooseberry
Ribes cynosbati, Prickly Gooseberry
Ribes gracile, Missouri Gooseberry
Ribes floridum, Wild Black Currant
Rosa acicularis, Prickly Wild Rose
Rosa carolina, Swamp Rose
Rosa blanda, Smooth Rose
Rosa humilis, Pasture Rose
Rosa rubiginosa, Sweetbrier
Rubus allegheniensis, High Bush Blackberry
Rubus canadensis, Millspaugh's Blackberry
Rubus hispidus, Hispid Blackberry
Rubus idaeus var. *aculeatissimus*, Wild Red Raspberry
Rubus occidentalis, Black Raspberry
Rubus parviflorus, Salmon Berry
Rubus odoratus, Purple Flowering Raspberry
Rubus villosus, Dewberry
Sambucus canadensis, Common Elder
Sambucus racemosa, Red-berried Elder
Shepherdia canadensis, Canadian Buffalo Berry
Smilax hispida, Hispid Greenbrier
Smilax rotundifolia, Common Greenbrier
Symphoricarpos occidentalis, Wolfberry
Symphoricarpos orbiculatus, Indian Currant
Symphoricarpos racemosus, Snowberry
Taxus canadensis, American Yew
Vaccinium canadense, Sour-top
Vaccinium corymbosum, High Bush Blueberry
Vaccinium macrocarpon, Large Cranberry
Vaccinium ovalifolium, Tall Bilberry
Vaccinium Oxycoccus, Small Cranberry
Vaccinium pennsylvanicum, Low Sweet Blueberry
Vaccinium stamineum, Deerberry

Vaccinium uliginosum, Bog Bilberry
Vaccinium vacillans, Late Low
 Blueberry
Vaccinium Vitis-Idaea, Cowberry
Viburnum acerifolium, Mapleleaf
 Viburnum
Viburnum alnifolium, Hobble-bush
Viburnum cassinoides, Withe-rod
Viburnum dentatum, Arrow-wood
Viburnum Lentago, Nanny-berry
Viburnum Opulus var. *americanum*,
 High-bush Cranberry

Viburnum pauciflorum, Squashberry
Viburnum prunifolium, Black Haw
Viburnum pubescens, Downy Arrow-
 wood
Vitis aestivalis, Summer Grape
Vitis bicolor, Winter Grape
Vitis cordifolia, Frost Grape
Vitis labrusca, Northern Fox Grape
Vitis rotundifolia, Muscadine
Vitis vulpina, River-bank Grape

Collecting—In the section on Rare Species reference is made to the fact that it would be highly desirable for the beginner to collect certain shrubs and supply specimens to our principal state herbaria. This would necessitate having collecting equipment adequate for the purpose and a few words of instruction as to what to get and how to use it follow.

A botanizing outfit may be as simple or as elaborate as one's pocket-book permits. The following list will prove adequate for all practical purposes in collecting specimens. If the student wishes to establish an herbarium for his specimens he will need mounting papers and genus covers, labels, gummed cloth, etc. However, if he merely collects the specimens for others they may be sent to the herbarium without mounting.

1. Vasculum or collecting case. A tin box in the shape of a flattened cylinder with a hinged opening the entire length to permit of entering the plants with the minimum of bending or breaking. The secret of keeping plants fresh lies in keeping them from the air and these tin boxes do this admirably.

2. Small pruning shears. For shrubs these are essential. A sharp pocket knife is a reasonably good substitute. In collecting herbaceous plants where it is desirable to include the roots a trowel is necessary.

3. Botanical plant press. Plant presses are varied, but a simple one consists of two perforated boards of equal size and thickness, a little larger than the mounting paper, and a number of sheets of drying paper, or blotters to fit them. Slatted presses, almost as easy to make as perforated boards provide better ventilation, hence quicker drying. The whole is kept in place by a double strap which may be tightened or loosened according to the number of plants and drying sheets in the press.

4. Drying papers and folders. Regular botanical drying paper may be purchased or thick blotting paper may be procured and cut to proper size. For the folders old newspapers cut as long as the mounting papers

and twice as wide, so that when folded once over they form covers the same size as the sheets are sufficient. The specimens to be pressed are placed in these covers. It is then possible to move them to change the dryers without disturbing them. Instead of old newspapers plain newspaper stock can be procured and cut to size at a nominal cost.

5. Ventilators. Sheets of corrugated board, cut the size of the blotters serve an important function in helping the work of blotters between which they are interspersed.

6. A small quantity of cotton-wool to be used in the form of pads to equalize the pressure around woody stems or large flower heads. Instead of the wool I use small pieces of newspapers torn to fit the requirements, which prove very satisfactory. The pieces can be dried and used repeatedly.

This about completes the list of necessary equipment for collecting and pressing botanical specimens. The plants should be pressed as soon as possible after gathering and enough specimens should be made for all required purposes. The plants should be arranged in the folders as nearly as possible in a natural manner, and the pressure equalized around the thick stems and heads with bits of newspaper or cotton-wool. One or more drying papers should be used between each folder. When all the plants have been put in the folders between the blotters and ventilators, the press should be strapped and left to dry. At first the dryers should be changed at least each twenty-four hours and the damp dryers dried out and stored for future use.

There are botanical supply houses which furnish all the above equipment and supplies. Their names will be supplied upon application to the publisher.

One of the most important points to remember in connection with collecting plants of any kind is to have complete data with every specimen. This should include exact location, township, county, etc., habitat, date, character of plant, color of blossom, collector and any information which would be useful in its study. Two methods are used. One is to prepare full notes in the field. These are given a number and the same number is affixed to the plant in the press and follows it, even into the herbarium. Usually plants are not named in the field, but are studied after the drying process is completed. The alternate plan is to place in the folder, slips giving the necessary data, or the information may be written on the folder itself.

A specimen in an herbarium without proper data is almost worthless. Data is fully as important as a name. In checking herbaria for distri-

bution records during the compilation of this bulletin a great many specimens were found without the location given. For example some specimens revealed that they were collected at "Mud Lake." The collector knew at the time where Mud Lake was located, but as there are probably a hundred Mud Lakes in Michigan the information was of no practical value. The collector knew where it was; but collectors die, are not always available when wanted, and they also forget. The only safe way is to be sure that all necessary data are on every specimen at the time they are collected or mounted.

In compiling this bulletin the scientific names follow the usage of 'Gray's Manual of Botany', 7th Edition. It is well known that certain improvements have been made in our knowledge of American plants since this manual was published in 1908. However, these improvements are contained in articles scattered through the botanical literature and would not be available to the average student. If the beginner, who starts with this bulletin, is to progress he must proceed to the great manuals for his next step. If he found these names differing from those here given it would certainly lead to confusion.

I believe fully that each plant should have but one scientific name. Hence no scientific synonyms as such are given in this bulletin. In a few instances when it seemed to be of interest reference is made to these synonyms in the comment following the formal description of the plant.

The principal objective of the scientific naming of plants is the establishment of a stable nomenclature. Actually, however, no such stability exists and single species have been known under many names. This has resulted chiefly from changes of ideas regarding relationship and from lack of agreement among investigators of the proper limits of genera and species. For instance, a plant which one botanist considers merely a species under an established genus another, equally competent, feels is sufficiently different to be placed in a separate genus. One botanist studying the large amount of variation among willows may recognize many species in one area. Another would consider them as local variants unworthy of a special name, or that they were merely hybrids. It all depends upon the investigator. Those who wish to erect a large number of species have been termed "splitters" and those who take the opposite view "lumpers." In the interests of the amateur for whom this bulletin has been produced I have tried to lean toward the conservative side.

The metric system of measurements has been used because it is in almost universal use in botanical manuals. The meter (m.) equals 39.37 inches, or approximately 3.3 feet, the decimeter (dm.) is approximately

4 inches, the centimeter (cm.) $\frac{2}{5}$ of an inch and the millimeter (mm.) $\frac{1}{25}$ of an inch.

In compiling this bulletin information and material for the descriptions have been drawn from a great variety of sources, all of which have been more or less freely consulted and compared. In addition the herbarium of the Cranbrook Institute of Science has been examined in special cases and my practical experience over a long period of field work largely influenced the accounts. The works consulted are listed in the bibliography at the end of this volume.

I wish here to testify to the valuable assistance which has been rendered so freely by others in compiling this bulletin. Owing to the fact that I am engaged in business it was necessary to have the herbarium at the University of Michigan checked by someone else. Mrs. C. L. Lundell attended to this for me in a thoroughly efficient manner. Valuable suggestions were also received from Dr. E. B. Mains and Dr. Lundell of the University Herbarium. I am also indebted to Dr. Ernst A. Bessy and Dr. Henry T. Darlington for placing at my disposal the facilities of the Herbarium at Michigan State College and for assistance in checking the same. Mrs. Marjorie T. Bingham, staff botanist at the Cranbrook Institute of Science has assisted with many useful suggestions and contributed generously of her time in smoothing out certain rough spots.

Thanks are due to Mr. William L. Wood, Superintendent of the Cranbrook Press for his particularly efficient assistance in the production of this book. To Mr. Thomas Cobbe and Mrs. R. T. Hatt go my grateful thanks for the excellence of the drawings, which illustrate the volume. Mr. Cobbe prepared figures 1-161; and Mrs. Hatt, the figures used in the pictorial glossary. The color frontispiece is by Dr. Hatt.

It seems proper to give credit here to those amateur field botanists with whom I tramped the fields and woods now many years ago while laying the foundation for an undertaking such as the compiling of this bulletin. They were an enthusiastic lot, and from earliest spring to snow-fall every week-end were searching for rare plants and making collections of the local flora for their own personal pleasure and information. To Mr. John M. Sutton must be given credit for introducing me to them, and for many years he was an enthusiastic member of the group. At that time Mr. C. K. Dodge was a frequent visitor to Detroit and accompanied us on our trips. Also Dr. Oliver A. Farwell was in Detroit and we all felt distinctly honored when he came along. Messrs. Benjamin Chandler and Bruno Gladewitz were exceptionally able amateur botanists, and contributed greatly to my education in field work. Chandler has

been dead these many years, but his memory lives on in the fine specimens he made and which are now deposited in various herbaria about the state. The same is true of Mr. Dodge. Mr. Branson A. Walpole, at that time in Ypsilanti, author of the 'Flora of Washtenaw County,' was often in our party. It is doubtful if the members of any group ever enjoyed themselves more than this one. Mrs. Billington, who for many years was a week-end botanical widow should come in for her fair share of the credit and it is here freely given. Without her ready coöperation this opportunity would not have come to me. The pleasant experiences and the good fellowship of those excursions will always remain a grateful memory with me, and if this little volume induces others to embark upon a similar course I shall feel abundantly repaid for the effort.

I am happy to acknowledge my indebtedness to Dr. Robert T. Hatt, Director of the Cranbrook Institute of Science, for working with me in producing this bulletin. It was he who suggested that I undertake the work and to him must go much of the credit for its form. His suggestions and advice relative to the composition of the book, illustrations, and the numerous other details involved helped materially in lightening the labor of final production. The attractive cover of the book was designed by Mr. Paul McPharlin, whose assistance is gratefully acknowledged.

Last, but by no means least, I am happy to acknowledge the equal contributions of a generous portion of the publication fund by Mr. A. N. Goddard and by the Michigan Sportsman's Fund, administered by Mr. Gustavus D. Pope. Such educational influence as this work may have in fostering an interest in our native shrubs and in instilling an appreciation of their importance in conservation, will be in no small part creditable to the help of these two contributions.

Ecological

Michigan is known as the Peninsula State, and is divided into two parts called the Upper and Lower Peninsulas. From east to west the Upper Peninsula measures 318 miles. In width it varies from 30 to 164 miles. The greatest length of the Lower Peninsula is 277 miles from north to south and its extreme width is 259 miles. The total area of both peninsulas is 58,915 square miles and, situated as it is within the waters of the Great Lakes, it has a coast line of over 1600 miles.

The upper and lower peninsulas are strikingly different in many respects. In the western portion of the Upper Peninsula are located the copper and iron bearing rocks which have made Michigan famous as a

mining state. The eastern portion of this peninsula is underlaid with stratified sedimentary rocks, and large portions of both sections are covered with glacial drift.

The Lower Peninsula is generally level or rolling. The entire surface is covered deeply with glacial drift consisting of sand, gravel and clay variously intermixed, and the topographical outlines are due to joint action of moving ice and flowing water during and following the glacial period. The peninsula is divided by lateral moraines into certain more or less clearly marked floral regions. All parts of the state are abundantly watered by its many small rivers and by some 5000 lakes which for the most part were left in the wake of the retreating glaciers. These geological factors are briefly mentioned because of their marked influence upon the vegetation of the state. In the bogs and marshes of Oakland County for example are to be found many species which are distinctly alpine. Here these species found a congenial habitat as the ice departed and have maintained themselves ever since.

Plants growing naturally group themselves into communities. This grouping is brought about by the character of the environment, certain plants thriving best under a given set of conditions of soil, moisture, etc. Thus plants requiring the same conditions will tend to grow together in the locality where those favorable conditions exist. The study of these communities is known as plant ecology, the science of the interrelations of plants and their environments. This is essentially an outdoor study and one of the most practical of the divisions of botany, since ecological principles form the basis for the practice of agriculture and forestry. Michigan has a great variety of soils and surface conditions which create a large number of well marked plant communities. Among the most prominent may be mentioned the following:

Sand dunes	Oak-Hickory forests
Jack Pine plains	Hemlock forests
Cedar-Tamarack bogs	Meadows
Beech-Maple forests	Lake shores

Each of these situations has its characteristic plants. For example, the Trailing Juniper is found mostly along the rocky shores of the northern counties. Likewise the Jack Pine plains have their quota of distinctive shrubs and other plants which are found growing in greater abundance there than in other localities.

However, it is not the function of this bulletin to treat of the ecological side of our native shrubs. Those readers who may wish to pursue the subject further will find ecology a most interesting and entertaining study.



Distribution

The general distribution of each species is given in connection with its botanical description. Likewise in connection with each shrub will be found its range in Michigan. For example, *Rubus occidentalis* L., the Black Raspberry is "common throughout," *Empetrum nigrum* L., Black Crowberry is "Upper Peninsula" and *Quercus prinoides* Willd., Dwarf Chestnut Oak, is "Infrequent, central and southern." This information has been taken from Beal's 'Michigan Flora' and other available sources.

In addition to the general probable Michigan range the accompanying maps set forth by counties the actual record as evidenced by herbarium specimens and published lists. The lists checked in compiling these maps are those items starred in the bibliography.

The herbaria of the University of Michigan, Michigan State College, and the Cranbrook Institute of Science were carefully checked. Many important private collections have been incorporated in these herbaria and it is felt that taken together they present an adequate cross section of the distribution of our Michigan flora. My own herbarium has been given to the Cranbrook Institute of Science where it is now housed. In addition I have to thank Professor Heber W. Youngken for informing me of the record of a specimen of the Hobble-bush in the herbarium of the Massachusetts College of Pharmacy.

It is certain that some or all of the shrubs are to be found in more localities than are here listed, but no such specimens are deposited in our principal state herbaria and they are not listed in any of the well-circulated published lists. Large areas of the state are under cultivation and obviously such areas are not particularly attractive to field botanists. This fact no doubt accounts for the scarcity of records in some instances. Michigan has not been as fortunate as Indiana where Mr. Charles C. Deam, over a period of forty years traveled 125,000 miles to collect in each of the 1016 townships of the state. It is doubtful if ever before the flora of an entire state has been so thoroughly studied as was Indiana. I have botanized as an avocation for some twenty-odd years, during which time I covered considerable territory, but compared to the whole, scarcely scratched the surface. Other botanists both amateur and professional have collected in various sections of the state, publishing lists of plants found, all of which have been consulted in compiling the maps. It is realized, however, that by far the greater areas of the state have not been botanized and that the distribution of any or all of the species may be much greater than is indicated. Also some of the records were made many years ago. Great changes have taken place, even in the last

quarter century and it would be strange indeed if some of the older stations had not been wiped out entirely. Marshes have been drained, forests removed and great areas burned over so frequently that the only wonder is there is any vegetation left at all. In a sense the distribution as shown by the maps is historical and the collector need not be surprised if plants which are recorded in a certain locality can no longer be found there.

Rare or Infrequent Species

In every given locality there are a number of plants which apparently, may be classified as rare. The reasons for this are twofold; the plant may actually be rare, or it may be that insufficient field work has been done to establish the facts.

The following list of shrubs has been selected for special mention because, so far as the records go, they are rare in Michigan. The beginning field botanist may do a really worthwhile piece of work by thoroughly exploring the theoretical range of these plants and establishing definitely whether they really are rare or whether their rarity is only apparent for the reason above stated. It is well known that amateur astronomers discover many of the new comets which visit our solar system from time to time, and also that they carry on an important work in connection with the cataloguing of stars and in other astronomical endeavors. It seems to me that there is an equally important field for the beginning systematic botanist in determining the distribution of our native plants. Such a work would provide a worthy objective the results of which would add much of value to the sum of human knowledge. Our great botanical manuals have been built up from the investigations of a large number of individuals carried on over a long period of time and the greater the number of investigators continuing the work the more accurate and thorough our records will become. In the list below many blanks in our knowledge of shrub distribution are noted and the filling in of these is a practical and worthy opportunity for the amateur botanist.

In checking the three large state herbaria for distribution records many gaps were found. If this is true of such prominent plants as the shrubs, it is probably even more so of other plants. Well-prepared specimens, properly labeled would be welcome in any herbarium and, while the laboratory botanist is engaged with his students in the classroom or struggling with profound problems in cytology or morphology the collector may be roaming the fields and woods in the fresh air and sunshine

surrounded by the trees, shrubs, flowers and birds, at the same time carrying on an important work of investigation—a truly ideal combination.

Among the rare or little-known species are:

Salix balsamifera Barratt. The records for this willow are from Keweenaw and Marquette Counties in the north and St. Clair and Genesee Counties in the south. Surely it must grow between these stations and a more thorough field study should be made to establish its exact distribution in the state.

Asimina triloba Dunal. The Papaw reaches the northern limit of its range in the southern portion of the state. It has been collected in Gratiot County. Is this the most northerly station?

Amelanchier oligocarpa (Michx.) Roem. The University of Michigan herbarium does not contain a specimen of this junberry and we have only two collections recorded, one from Keweenaw and the other from Oakland County. This may be occasioned in a measure by the confusion in nomenclature which surrounds the amelanchiers, but it seems certain that there must be other stations in Michigan.

Empetrum nigrum L. Here is a plant the range of which is clearly northern. Only three stations are recorded, Keweenaw, Alger and Schoolcraft Counties, all in the northern peninsula. It must be scattered all through this section and further records would be helpful in establishing its distribution in the state.

Fatsia horrida (Sm.) B. & H. This is truly a rare plant. The only station known in this part of the country is Isle Royale, Keweenaw County, where it is at least seven or eight hundred miles east of its principal range. Its presence here presents a problem in the distribution of species for the beginner to work on. A theory has been proposed. See if you can discover it. Incidentally the plant might be looked for in other counties along Lake Superior in the Upper Peninsula.

Lyonia ligustrina (L.) DC. Here is a shrub which, according to the authorities should not be in Michigan at all. 'Gray's Manual' gives its range as "central Maine to central New York and southward." Beal's 'Michigan Flora' records it as follows: "Keweenaw Point, Dr. Robbins." Another record is from Newaygo County where it was found in 1915 by Dr. Henry T. Darlington. One station is at the extreme northern tip of the Upper Peninsula and the other about the middle of the Lower Peninsula. One would expect that a thorough botanizing of the

intervening territory would bring to light other stations, and specimens with proper data would be welcome. Only by such field work can the exact distribution of our flora be ascertained and future manuals reflect the facts.

Vaccinium stamineum L. This apparently is a very rare huckleberry. In checking the herbaria and lists for this bulletin the only record discovered was from Washtenaw County.

Vaccinium uliginosum L. The Bog Bilberry is recorded only from Isle Royale and Keweenaw County. 'Gray's Manual' gives its range as follows: "Arctic America, south to the barrens of Washington County, Maine, mountains of northern New England and northern New York and northern Michigan."

Vaccinium caespitosum Michx. Beal's 'Michigan Flora' lists the Dwarf Bilberry as follows: "Shores of Lake Superior and westward, A. Gray, Flora of North America; Lyons, U. P." It will be noted that no specific localities are given. In checking the several herbaria for distribution no specimens were found and it was not recorded in any of the lists examined. It undoubtedly grows in Michigan, and it would be a most worth-while piece of work to locate it and supply specimens to the various state herbaria.

Vaccinium Vitis-Idaea L. var. *minus* Lodd. This arctic plant is called the Rock Cranberry. Its general range as given in 'Gray's Manual' is as follows: "Arctic America, south to the mountains of Maine, New Hampshire and Vermont, Lake Superior, etc. and along the coast to Cape Ann, Mass." The only record of it is from Isle Royale, made by A. E. Frost in 1868, and it has not been collected since. Beal does not list it in his Michigan Flora, and it is included in this bulletin with the idea that some beginning systematic botanist may have the thrill of re-discovering it and establishing it firmly as a member of our flora.

Lonicera involucrata (Richards) Banks. The only records of this honeysuckle are from Keweenaw and Washtenaw Counties, about as far apart in the state as it is possible to have them. Is it to be found in other localities?

Viburnum alnifolium Marsh. In checking the distribution of Michigan shrubs for this bulletin no specimen of the Hobble-bush was found, though Whitney (1851) reported the species common in the Upper Peninsula. Dr. Heber W. Youngken has kindly informed me that he collected a specimen August 12, 1938 at Pentwater, Oceana County,

Michigan. This specimen is in the Massachusetts College of Pharmacy. I have found it at Muskoka Lakes in Ontario and specimens from this station are in the Cranbrook herbarium. Michigan is well within its range and a thorough search will doubtless discover other stations.

Viburnum pauciflorum Raf. This viburnum is only recorded from Isle Royale, Keweenaw County. The range for it in 'Gray's Manual' is given as follows: "Newfoundland and Labrador to Alaska, south to the mountains of Cape Breton Islands, Northern New England, Allegheny County, Pennsylvania, northern Michigan, Minnesota, Colorado and Washington." Rosendahl and Butters in 'Trees and Shrubs of Minnesota' give the distribution of this species in their state as follows: "In cold woods north of Lake Superior." Minnesota extends out over Lake Superior and comes very close to Isle Royale. Although this island is a part of Michigan it is much closer to Minnesota than to the state of which it is a part and it is possible that *Viburnum pauciflorum* does not grow on the mainland of Michigan. It would be interesting to have this determined definitely and it is hoped that some beginning systematist may get the inspiration to make the necessary search from his perusal of this bulletin.

Plant Names and Their Authors

The naming of plants today is based on the binomial system, which was established by Linnaeus in 1753. Before that time plants had been studied and named, but they had no accepted or uniform short definite technical names. The pre-Linnaean botanists used what really amounted to a brief description of the plant. In this connection it should be remembered that most of those who wrote of plants then were known as herbalists and were primarily interested in the healing virtues of plants. There were some, however, who were interested directly in the study of plants with a view to identifying them, much as is done by our systematists of today, and many generic and other names, which were in use prior to 1753, were adopted by Linnaeus.

In 'Gray's Manual of Botany,' 7th Edition, these pre-Linnaean names are indicated by the use of a square bracket, []. This same method is here used as a matter of interest to the student. Since the time of Linnaeus the naming of plants has proceeded at an accelerated pace. In order to conserve space in the manuals there has grown up a system of abbreviations of authors' names. For example instead of using the full name of Linnaeus it is abbreviated by using simply the capital L. after the binomial name of the plant or in some cases the surname is

given in full without initials as Gray for Asa Gray, the great American botanist. To make it possible for the student to identify the authors who named the shrubs in this bulletin a list of their names in full follows together with the abbreviations used in each case.

<i>Adans.</i> —Adanson, Michel	<i>Michx.</i> —Michaux, André
<i>Ait.</i> —Aiton, William	<i>Mill.</i> —Miller, Philip
<i>B. & H.</i> —Bentham, George, and Hooker, Joseph Dalton	<i>Muhl.</i> —Muhlenberg, G. H. E.
<i>C. A. Mey.</i> —Meyer, Carl Anton	<i>Neck.</i> —Necker, Noel Joseph de
<i>Coul.</i> —Coulter, John Merle	<i>Nees.</i> —Nees von Esenbeck, Christian Gottfried
<i>DC.</i> —DeCandolle, Augustin Pyramus	<i>Nutt.</i> —Nuttall, Thomas
<i>Dene.</i> —Decaisne, Joseph	<i>Pall.</i> —Pallas, Peter Simon
<i>Desf.</i> —Desfontaines, Rene Louiche	<i>Pers.</i> —Persoon, Christian Hendrik
<i>Dill.</i> —Dillenius, Johann Jacob	<i>Planch.</i> —Planchon, Jules Emile
<i>Dougl.</i> —Douglas, David	<i>Poir.</i> —Poirer, Jean Louis Marie
<i>Eat.</i> —Eaton, Amos	<i>Poll.</i> —Pollich, Johann Adam
<i>HBK.</i> —Humboldt, F. Alexander von, Bon- pland, Aimé and Kunth C. S.	<i>Raf.</i> —Rafinesque-Schmalz C. S.
<i>Hook.</i> —Hooker, William Jackson	<i>Richards.</i> —Richardson, John
<i>Jacq.</i> —Jacquin, Nicolaus Joseph	<i>Roem.</i> —Roemer, M. J.
<i>L.</i> —Linnaeus, Carolus	<i>Rydb.</i> —Rydberg, Per Axel
<i>L.f.</i> —Linnaeus, Carl von (the son)	<i>Sm. Smith.</i> —James Edward
<i>Lam.</i> —Lamarck, J. B. A. P. Monnet	<i>Spreng.</i> —Sprengel, Kurt
<i>L'Her.</i> —L'Heritier de Brutelle, C. L.	<i>Torr.</i> —Torrey, John
<i>Lindl.</i> —Lindley, John	<i>T. & G.</i> —Torrey, John and Gray, Asa
<i>Lodd.</i> —Loddiges, Conrad	<i>Tourn.</i> —Tournefort, Joseph Pitton de
<i>Marsh.</i> —Marshall, Humphrey	<i>Trel.</i> —Trelease, William
<i>Maxim.</i> —Maximowicz, Carl Johann	<i>Walt.</i> —Walter, Thomas
<i>Medic.</i> —Medicus, Friederich Casimir	<i>Wang.</i> —Wangenheim, F. A. J. von
	<i>Willd.</i> —Willdenow, Carl Ludwig

As stated above plant names are now generally made up of two words. The first word represents the genus to which it belongs and is a noun. It is always written with a capital letter. The second word which indicates the species, is an adjective and is rarely capitalized. Examples are: *Taxus canadensis* Marsh., *Rosa blanda* Ait., *Salix candida* L. In some instances varieties are recognized and named. When this is the case the name of the plant consists of three words and it is written thus: *Rubus allegheniensis* Porter var. *Gravesii* Fernald; which means simply that Mr. Fernald has studied a *Rubus allegheniensis* which he feels is entitled to varietal rank and has named it after Mr. Graves. For the most part varieties have been omitted from this bulletin. The species are gathered into genera, the genera into families, the families into orders, the orders into classes and the classes into divisions. The study of all these is highly interesting, but beyond the scope of this bulletin.

Generic names sometimes represent a character belonging to the entire group of species. Sometimes they are ancient, having been in use prior to the time of Linnaeus and adopted by him. Others are fanciful and have no reference to the character of the plant named, while others seek to render imperishable the name of some man. A splendid example of

the latter is the Twin-flower, which is named *Linnaea borealis*, being dedicated to Linnaeus, who first pointed out its characters and with whom it was a special favorite. Another is *Kalmia*, the laurel, dedicated to Peter Kalm, a pupil of Linnaeus who traveled in America.

Here follows a list of all the generic names used in this bulletin, with a brief statement of their origin. Where they were in use before Linnaeus the names are referred to as ancient or classical.

Acer. The classical name, from the Celtic *ac*, hard.

Alnus. The ancient Latin name derived from the Celtic, in allusion to the growth of these plants along streams.

Amelanchier. This name is supposed to be barbaric.

Amorpha. From the Greek word meaning 'deformed', because of the absence of four of the petals.

Andromeda. Named by Linnaeus for Andromeda of Greek mythology. An example of fanciful naming above referred to.

Aralia. The derivation of this name is unknown.

Arctostaphylos. Name composed of two Greek words meaning 'bear' and 'berry', bearberry.

Asimina. From the aboriginal name *Assimin*.
Benzoin. So named because of its odor which resembles that of benzoin, an Oriental gum.

Betula. The ancient name.

Ceanothus. An obscure name used by Theophrastus, probably misspelled.

Celastrus. Greek name of some evergreen tree.

Cephalanthus. Name composed of two Greek words meaning a 'head' and a 'flower', head-flower.

Chamaedaphne. From two Greek words, 'on the ground' and 'laurel'; low *Daphne*.

Cornus. From the word *cornu*, a horn, in reference to the toughness of the wood.

Corylus. Name Greek, from the helmet-like involucre.

Crataegus. Named from a Greek word meaning 'strength', because of the hardness and toughness of the wood.

Diervilla. A name given as a compliment to Dr. N. Diéreville, who first carried the plant from Canada to Tournefort, the author of the genus.

Dirca. Name of uncertain derivation, but probably so called from a fountain in Thebes. Another example of fanciful naming.

Empetrum. An ancient name derived from two Greek words meaning 'upon a rock'.

Epigaea. Name composed of two Greek words meaning 'upon' and 'the earth', referring to the trailing growth of the *Arbutus*.

Evonymus. Name from the ancient Greek words 'good' and 'name'.

Fatsia. From the Japanese vernacular name of one of the species.

Gaultheria. Named in honor of Dr. Hugues Gauthier, a naturalist and physician of Quebec, in the middle of the 18th century.

Gaylussacia. Named for the celebrated chemist, Gay-Lussac.

Hamamelis. Greek, 'with the apple', the flowers and fruit being borne together.

Hudsonia. Named in honor of William Hudson, an early English botanist.

Hypericum. An ancient Greek name of obscure meaning.

Ilex. The ancient Latin name of the Holly Oak.

Juniperus. The classical name.

Kalmia. Dedicated to Peter Kalm, pupil of Linnaeus, who traveled in America.

Ledum. Greek, *ledon*, the plant now called *Cistus Ledon*.

Lonicera. Named in honor of Adam Lonitzer, a German botanist and explorer of the southern Allegheny mountains.

Lyonia. Named for John Lyon, early American botanist and explorer of the southern Alleghanies.

Myrica. The ancient Greek name of the Tamarisk or some other shrub; or perhaps from the word meaning 'to perfume'.

Nemopanthus. Name stated by the author to mean flower with a filiform peduncle.

Physocarpus. Name derived from two Greek words meaning 'a pair of bellows' and 'fruit'.

Potentilla. Diminutive of *potens*, 'powerful', from the medicinal properties of some species.

Prunus. The ancient Latin name of the plum tree.

Psedera. Name supposed to be a contraction of two Greek words, 'false' and *Hedera*, the ivy; false-ivy.

Ptelea. The Greek name of the elm, applied in this instance to a plant with similar fruit.
Pyrus. The classical name of the pear tree.
Quercus. The classical Latin name of probable Celtic derivation meaning beautiful tree.
Rhamnus. The ancient Greek name.
Rhus. The ancient Greek and Latin name.
Ribes. The Arabic name, *ribes*.
Rosa. The ancient Latin name.
Rubus. The Roman name of the bramble, from *ruber*, 'red'.
Salix. The classical Latin name.
Sambucus. Ancient Latin name of the elder.
Shepherdia. Named for John Shepherd, once curator of the Liverpool Botanical Gardens.
Smilax. An ancient Greek name of obscure meaning.

Spiraea. From a Greek word meaning to twist, because of the twisting of the pods in some of the original species.
Staphylea. From the Greek word meaning a cluster.
Symphoricarpos. Name composed of two Greek words meaning 'to bear together', and 'fruit'; referring to the clustered berries.
Taxus. The classical name, probably from the Greek name, 'a bow', the wood having been used for bows.
Vaccinium. Ancient Latin name of obscure derivation; perhaps blueberry.
Viburnum. The ancient Latin name.
Vitis. The classical Latin name.
Zanthoxylum. Derived from two Greek words meaning 'yellow' and 'wood'.

Specific names more generally refer to some distinctive peculiarity of the plant. Occasionally, however, as with generic names, the author has sought to honor some friend or famous person by naming a plant after him. A good example of this is *Cornus Baileyi* Coult. & Evans, which was named for L. H. Bailey, the eminent American author of horticultural works. For the most part, however, specific and varietal names refer to some outstanding character of the plant, its habit or the locality from which it was first described. These names are all Latinized in one form or another, the endings varying with the gender of the preceding generic noun.

In order that the student may gain an understanding of their meaning the following glossary of the Latin specific terms used in this bulletin is included.

acerifolium. Leaves like the maple.
acicularis. Slender, needle-shaped or needle-pointed.
aculeatissimus. Thorny, prickly or pointed.
aestivalis; aestivale. Summer-flowering.
albinervium. Whitish, pale.
allegheimensis. Growing in the Allegheny mountains.
alnifolia; alnifolium. Leaves like the alder, or alnus.
alternifolia. Leaves alternating on opposite sides of the stem.
americana; americanum; americanus. From America.
Amomum. Referring to the acrid seeds of the shrub.
angustifolia. Narrow-leaved.
asperifolia. Rough-leaved.
asplenifolia. Like the fern genus *asplenium*.
atroccocum. Having black fruit.
atropurpurea; atropurpureus. Dark-purple.
cordata. Heart-shaped.

arbutifolia. Leaves like the arbutus.
baccata. Berry-like.
Baileyi. Honoring L. H. Bailey, the eminent horticulturist.
balsamifera. Producing balsam.
bicolor. Two-colored.
blanda. Smooth; agreeable; pleasant; charming.
caespitosum. Growing in tufts; matted.
caerulea. True blue; sky-blue.
calyculata. Having bracts resembling, or imitating, an outer calyx.
canadensis. Canadian.
candida. White; hoary.
canescens. Grayish-white; hoary.
carolina. From Carolina.
cassinoides. Helmet-shaped.
circinata. Round-leaved.
coccinea. Scarlet.
communis. Growing together, or in society; common.
copallina. Yielding gum-copal.

cordifolia. Having heart-shaped leaves.
corymbosum. Arranged in corymbs.
crispa. Curled closely.
Crus-galli. Cock-spur.
cuneata. Wedge-shaped.
Cynosbati. Dogberry.
dentatum. Toothed, as saw teeth.
depressa. Flattened; lying down flat.
dioica. With the stamens and pistils in separate flowers on different plants.
discolor. Two-colored; having different colors.
floridum. Bearing flowers; flowering.
fruticosa. Bushy; shrubby.
Gale. An aromatic plant.
glabra. Smooth; without hairs.
glandulifera. Having small glands.
glandulosa. Glandular.
glaucescens. Covered with a gray bloom; glaucous.
glaucophylla. Having gray-blue leaves.
gracile. Slender, slight in form.
groenlandicum. From Greenland.
hispida; *hispidus*. Having stiff hairs or bristles.
hirsuta. Rough, hairy; having long distinct hairs.
horizontalis. Level; horizontal.
horrida. Horrible; offensive.
humilis. Low-growing.
incana. Gray with age; hoary.
involutrata. With an involucre.
Kalmianum. Named for Peter Kalm.
labrusca. A very old name pertaining to the wild grapevine.
lacustre. Living by the lake.
Lentago. Ancient Latin name of a shrub.
ligustrina. Privet-like; resembling privet.
longifolia. Bearing long leaves.
Lonicera. The honeysuckle.
lucida. Shining; glistening.
macrocarpon. Bearing large fruit.
melanocarpa. Bearing dark or black fruit.
membranaceum. Being of the texture of membranes.
minus. Small; less.
mollis. Soft; tender.
mucronata. Having a stiff and sharp point.
nigra; *nigrum*. Black.
oblongifolia. With oblong leaves.
obovatus. Obovate; reversed ovate.
occidentalis. Western.
odoratus. Sweet-smelling; fragrant.
oligocarpa. Bearing but little fruit.
opulifolius. Having leaves like the snowball bush, *Viburnum opulus*.
Opulus. Snowball; cranberry.
ovalifolium. Bearing oval leaves.
ovatus. Elliptic, the broader end toward the base.

oxyacanthoides. Resembling the hawthorn, with sharp spines.
Oxycoccus. Bearing acid berries; cranberry.
palustris. Bog-loving; growing in swampy ground.
paniculata. Having panicles of flowers.
parviflorus. Bearing small flowers.
pauciflorum. With few flowers.
pedicellaris. With distinct flower stalks.
pennsylvanicum. From Pennsylvania.
petiolaris. Stalked; petioled.
Polifolia. Many-leaved.
prinoides. Resembling winter-berry.
procumbens. Lying along the ground; trailing.
prolificum. Prolific.
prostratum. Lying flat on the ground.
prunifolium. Bearing leaves like the plum tree.
pubescens. Downy with soft short hairs.
pumila. Low; dwarfish; little.
punctata. Marked with dots.
quinquefolia. Five leaflets.
racemosa; *racemosus*. Bearing racemes.
repens. Creeping and rooting.
rostrata. Having a beak.
rotundifolia. Having round leaves.
rubiginosa. Rust-colored; rusty.
salicifolia. Bearing leaves like the willow.
sanguinea. Blood-red; bloody.
scandens. Climbing.
sericea. Silky.
serissima. Late-fruiting.
setigera. Bristle-bearing.
spicata; *spicatum*. Spike-like; pointed.
spinosa. Bearing spines; spiny.
stamineum. With prominent stamens; stamen-like.
stolonifera. Bearing suckers or runners.
syrticola. Growing on a sand bank.
tomentosa. Covered with short, soft matted hairs; woolly.
Toxicodendron. Poison-leaved.
triflorus. Three-flowered.
trifolia; *trifoliata*. With three leaflets; three-leaved.
triloba. With three lobes.
tristis; *triste*. Dull-colored; sad; gray.
typhina. Shaped like antlers.
uliginosum. Growing in mud.
Uva-ursi. Bearberry.
vacillans. Swaying; unsteady.
Vernix. Varnish.
verticillata. Whorled.
villosa; *villosus*. Downy; with shaggy hairs.
virginiana. Virginian.
vitaceae. Vine-like; like the grape vine.
Vitis-Idaea. Very ancient name of doubtful application.
vulpina. Fox-like; pertaining to a fox, *vulpes*; reddish-brown, the color of the fox.

The study of plant names both botanical and common is very interesting and a considerable bibliography is available to those wishing to pursue the subject further.

The Form and Structure of Shrubs

A pictorial glossary of the principal terms used in describing the shrubs included in this bulletin.

When I informed a friend that I was compiling a bulletin on the shrubs of Michigan, he instantly asked if sufficient pictures were being used to make the work useful to beginners; stating that no amount of words could take the place of illustrations. Concurring in the idea, although the usual glossary had already been prepared, it was decided to include illustrations for those descriptive terms which would permit of such treatment and where it was felt the illustration would make the terms more understandable. The illustrations are arranged alphabetically in accordance with the usual practice for glossaries and it is hoped they will prove useful to the student.


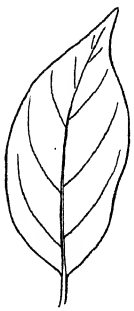
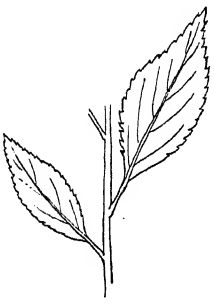
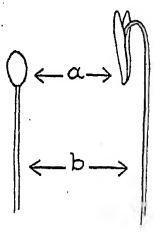

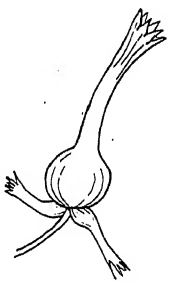
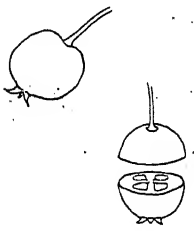
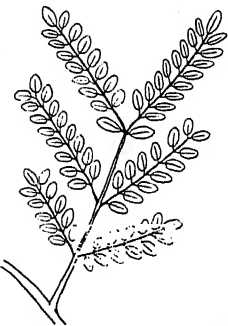

In the descriptions of the shrubs there will be found many combinations of the terms herein listed and illustrated. For example "crenulate-serrate" and "crenulate-denticulate." The terms are thus used to indicate a combination of forms somewhat modified. Teeth which are crenulate-serrate would neither be purely crenulate nor serrate, but an intergrading of the two. The same applies to crenulate-denticulate.



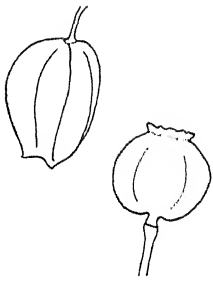
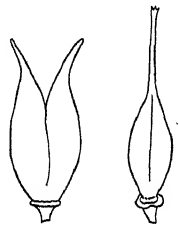
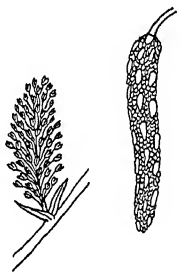
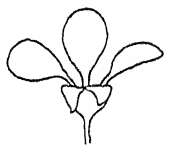
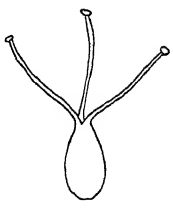

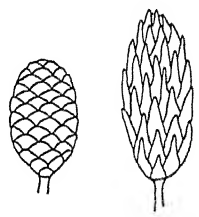
In the shapes of leaves we have the same thing. A leaf may be too narrow to be classed as elliptic and still too wide to be strictly lanceolate. When this occurs it is called elliptic-lanceolate, a modification of the two forms. Linear-lanceolate is another combination of descriptive terms the meaning of which is obvious.

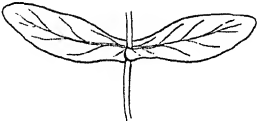
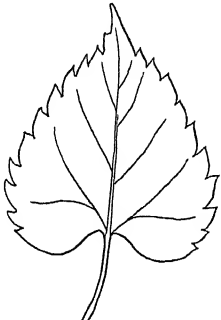
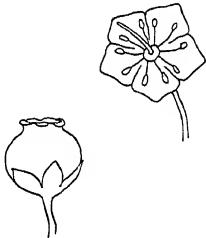
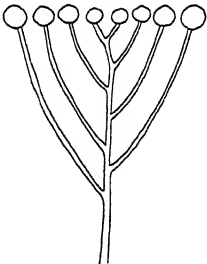
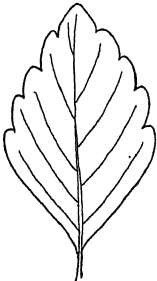
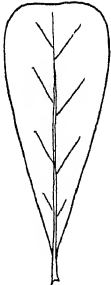
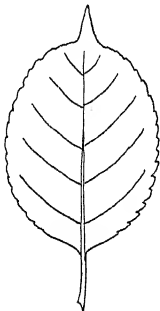
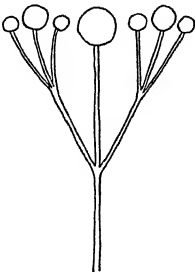
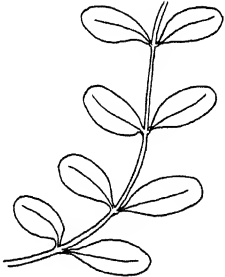
In the shape of the corolla will be found such descriptive terms as long-campanulate. In this case the corolla is bell-shaped, but the tube is somewhat longer than would ordinarily be applied to a strictly campanulate form.

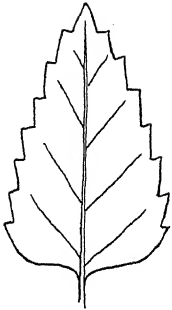
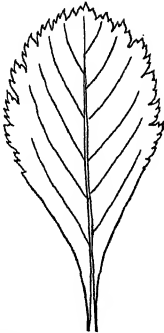
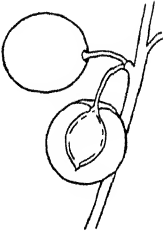
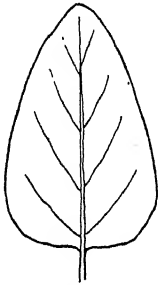
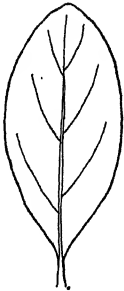




The same principle holds true in describing fruits where we find the term subglobose to describe a berry which is slightly less than a globe in form.

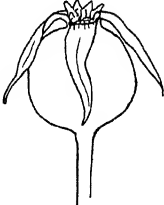

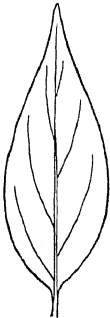


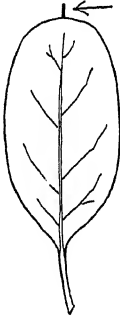
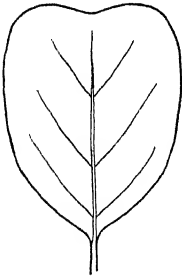


The student will have no difficulty in mastering these combined terms. They are too inexact to translate into satisfactory illustrations and are further evidence of the great variability of plants and the difficulty experienced by man in trying to accurately fit description to them.

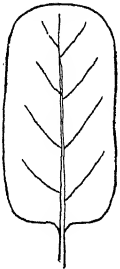
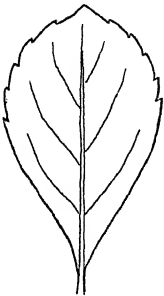
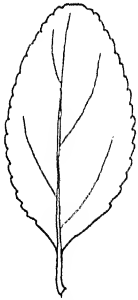
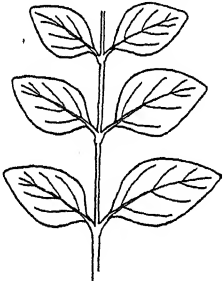
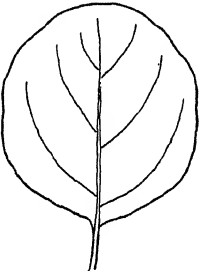
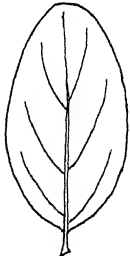
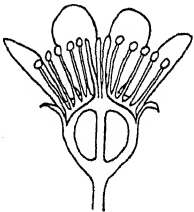
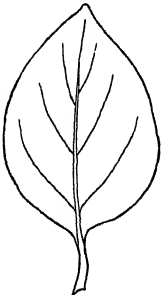

<p>acuminate (at apex)</p> 	<p>acute (at apex)</p> 	<p>alternate (leaved)</p> 
<p>anther b=filament</p> 	<p>axillary</p> 	<p>beaked</p> 
<p>berry</p> 	<p>bi-pinnate</p> 	<p>bract</p> 

<p>calyx</p> 	<p>campanulate (corolla)</p> 	<p>capsule</p> 
<p>carpel</p> 	<p>catkin</p> 	<p>clawed (petal)</p> 
<p>cleft</p> 	<p>compound (leaf)</p> 	<p>cone</p> 

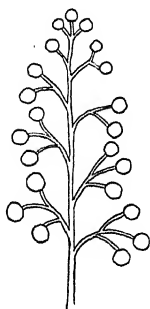
<p>connate-perfoliate</p> 	<p>cordate (at base)</p> 	<p>corolla</p> 
<p>corymb</p> 	<p>crenate</p> 	<p>cuneate</p> 
<p>cuspidate</p> 	<p>cyme</p> 	<p>decumbent</p> 

<p>dentate</p> 	<p>doubly-serrate</p> 	<p>drupe</p> 
<p>elliptic</p> 	<p>entire</p> 	<p>follicle</p> 
<p>funnel-form (corolla)</p> 	<p>gibbous</p> 	<p>head</p> 

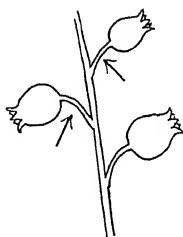
<p>hip</p> <p>(rose)</p> 	<p>involucre</p> 	<p>lanceolate</p> 
<p>linear</p> 	<p>lobed</p> 	<p>mucronate</p> 
<p>obcordate</p> 	<p>oblanceolate</p> 	<p>oblique</p> 

<p>oblong</p> 	<p>obovate</p> 	<p>obtuse (at apex)</p> 
<p>opposite (leaved)</p> 	<p>orbicular</p> 	<p>oval</p> 
<p>ovary</p> 	<p>ovate</p> 	<p>palmate</p> 

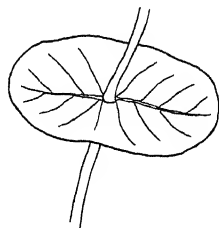
panicle



pedicel



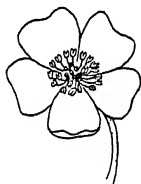
perfoliate



perianth



petals

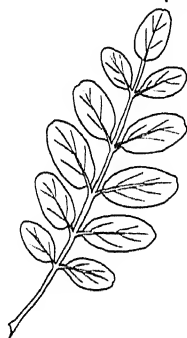


petiole



pinnate

(odd)

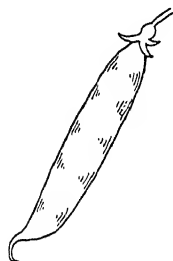


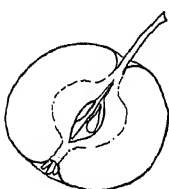

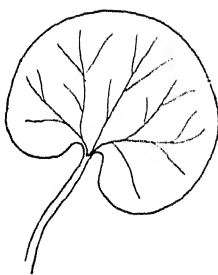


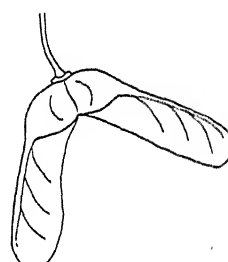
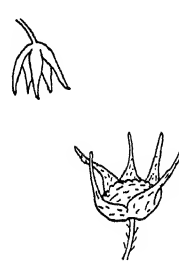

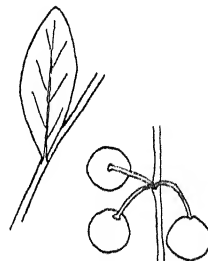
pistil

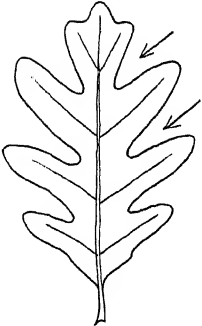


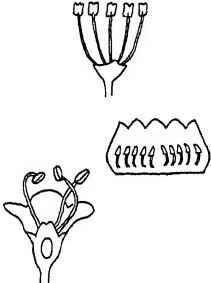
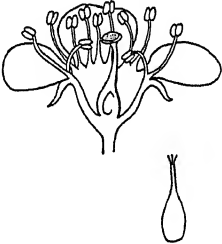
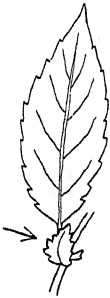
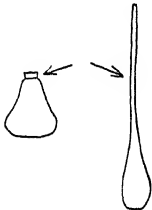

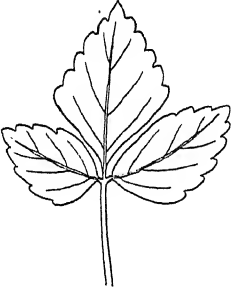
(single)

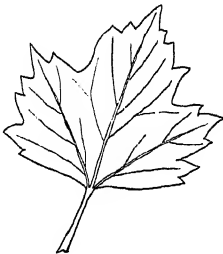
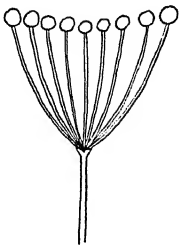
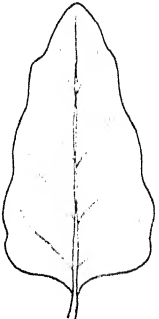


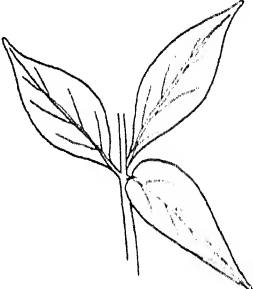
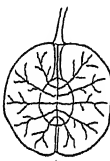


pod



<p>pome</p> 	<p>raceme</p> 	<p>reniform</p> 
<p>rostrate</p> 	<p>salver-shaped (corolla)</p> 	<p>samara</p> 
<p>sepal</p> 	<p>serrate</p> 	<p>sessile</p> 

sinus 	spatulate 	spike 
stamens 	stigma 	stipule 
style 	terminal 	trifoliate 

<p>truncate (at base)</p> 	<p>umbel</p> 	<p>undulate</p> 
<p>urceolate</p> 	<p>verticillate</p> 	<p>whorled</p> 
	<p>winged</p> 	

Keys to the Genera of Michigan Shrubs

These keys have been adapted from and follow the general style of 'Keys to Woody Plants,' by W. C. Muenscher, 1936, Ithaca, N. Y.

KEY I

Shrubs with scale-like, linear or needle-like leaves.

1. Leaves alternate, scattered
 2. Leaves less than 3 mm. long, scale-like, close pressed and imbricated, densely pubescent; low shrub.....*Hudsonia*, p. 167
 2. Leaves more than 3 mm. long, not scale-like
 3. Leaves strongly involute, blunt; fruit a red or pulpy berry-like drupe.....*Empetrum*, p. 137
 3. Leaves flat, green beneath, sharp-pointed, not over 2 mm. wide; fruit red, drupe-like.....*Taxus*, p. 49
1. Leaves in whorls of 3, needle-like, with a white line beneath, or sometimes scale-like on the same plant; fruit berry-like.....*Juniperus*, p. 49

KEY II

Shrubs with opposite, pinnately compound leaves.

1. Leaflets 3, of nearly equal size; petioles long; older bark white-striped; flowers in drooping racemes; fruit a bladder-like inflated capsule.....*Staphylea*, p. 151
1. Leaflets 5-11, oblong, or ovate-lanceolate; bark with large raised, corky lenticels; flowers in compound cymes; fruit small and berry-like.....*Sambucus*, p. 231

KEY III

Shrubs with alternate compound leaves.

1. Leaves bipinnately compound; stems prickly; fruit drupe-like.....*Aralia*, p. 173
1. Leaves once compound
 2. Leaves 3-foliolate
 3. Stipules present
 4. Stipules attached to the petiole for at least half their length.....*Rosa*, p. 119
 4. Stipules not attached to the petiole for half their length.....*Rubus*, p. 111
 3. Stipules absent
 5. Lateral leaflets not symmetrical; without tendrils; often climbing by aerial roots; fruit a whitish drupe.....*Rhus Toxicodendron*, p. 143
 5. Lateral leaflets symmetrical
 6. Petioles 1-3 cm. long, leaf margins crenate; fruit a red drupe.....*Rhus canadensis*, p. 144
 6. Petioles 5-10 cm. long; leaf margins entire or serrulate; fruit a winged samara.....*Ptelea*, p. 135
 2. Leaves more than 3-foliolate
 7. Leaves palmately compound
 8. Stems with spines or prickles, biennial; fruit a collection of small drupes on a spongy receptacle.....*Rubus*, p. 111
 8. Stems without spines or prickles; a vine climbing by branched tendrils; fruit a berry.....*Pseuderacia*, p. 159
 7. Leaves pinnately compound
 9. Stems without thorns, prickles or bristles
 10. Leaflets entire
 11. Leaflets subtended by stipels, 21-51, about 1-1.5 cm. long, white-canescens; fruit a pod.....*Amorpha*, p. 133
 11. Leaflets not subtended by stipels

12. Leaflets 5-7, about 1 cm. long, silky; low shrub with shreddy bark; petals yellow; fruit a collection of dry achenes.....*Potentilla*, p. 109
12. Leaflets 7-13, about 4-11 cm. long, mostly glabrous; tall shrub; fruit a small whitish drupe.....*Rhus Vernix*, p. 141
10. Leaflets dentate, or only a few-toothed toward the apex, opposite, nearly sessile; axis of leaf wing-margined in one species; sap milky; fruit a sort of dry drupe.....*Rhus*, p. 139
9. Stems bearing thorns, prickles or bristles
 13. Stipules absent; leaflets dotted with pellucid glands, margins entire; wood yellow; fruit a capsule with a strong lemon flavor.....*Zanthoxylum*, p. 135
 13. Stipules present; leaflets without pellucid glands; wood not yellow; no lemon odor
 14. Stipules attached to the petiole half their length or more; margin of leaflets evenly serrate.....*Rosa*, p. 119
 14. Stipules attached at the base of the petiole only; margin of leaflets generally coarsely and unevenly toothed or doubly serrate.....*Rubus*, p. 111

KEY IV

Shrubs with opposite or whorled simple leaves.

1. Leaves with lobes
 2. Petioles usually with stipules and glands; fruit a drupe.....*Viburnum*, p. 221
 2. Petioles without stipules and glands; fruit a samara.....*Acer*, p. 153
1. Leaves without lobes
 3. Stems climbing, ascending or decumbent
 4. Leaves connate, sessile or on stalks less than 8 mm. long, green beneath; flowers large, 2-lipped; fruit a berry.....*Lonicera*, p. 211
 4. Leaves oblanceolate, finely serrate, nearly sessile; flowers regular, small, dark-maroon; fruit a rough capsule; seeds red.....*Evonymus*, p. 147
 3. Stems erect or ascending
 5. Margin of leaves entire
 6. Leaves and twigs covered with rusty scales.....*Shepherdia*, p. 171
 6. Leaves and twigs not covered with rusty scales
 7. Leaves with pellucid dots; low shrubs; fruit a capsule.....*Hypericum*, p. 166
 7. Leaves without pellucid dots
 8. Twigs 2-edged, flattened or winged; leaves sessile or practically so, leathery, lower surface glaucous, margin serrate.....*Kalmia polifolia*, p. 185
 8. Twigs not 2-edged, flattened or winged; leaves with distinct petioles
 9. Leaves persistent, tending to be crowded toward the end of the season's growth, often in whorls of 3, leathery; fruit a capsule.....*Kalmia*, p. 183
 9. Leaves deciduous, scattered in pairs along the season's growth, or sometimes in whorls
 10. Lateral buds above the axils, imbedded in the bark; leaves often in whorls of 3; fruit a head of nutlets.....*Cephalanthus*, p. 208
 10. Lateral buds axillary, not imbedded in the bark; leaves opposite
 11. Bark of stems and branches loose, peeling off in long shreddy pieces; fruit a berry
 12. Twigs very slender; low shrub, 3-10 dm. high.....*Symphoricarpos*, p. 219
 12. Twigs of medium thickness; tall shrubs, over 1 m. high.....*Lonicera*, p. 211
 11. Bark of stems and older branches smooth, not peeling off in long shreds

13. Leaves with lateral veins running somewhat parallel with margin and meeting near the apex; fruit a drupe.....*Cornus*, p. 175
13. Leaves with lateral veins ending near the margin and not running to the apex; fruit a drupe.....*Viburnum*, p. 221
5. Margin of leaves not entire, usually serrate or dentate
 14. Opposite bases of petioles connected by a distinct transverse line or ridge
 15. Buds naked or with 1 pair of visible bud scales; fruit fleshy.....*Viburnum*, p. 221
 15. Buds not naked, with several overlapping scales; fruit a dry capsule.....*Diervilla*, p. 209
 14. Opposite bases of petioles not connected by a distinct transverse line or ridge; leaves glabrous on upper surface; petiole 5-18 mm. long; branchlets green; fruit a smooth capsule.....*Evonymus*, p. 147

KEY V

Shrubs with alternate simple leaves.

1. Leaves with lobes
 2. Stems climbing by tendrils without discs; vines.....*Vitis*, p. 161
 2. Stems erect
 3. Leaves palmately lobed and veined
 4. Older bark separating in numerous thin layers
 5. Leaves and twigs glandular-clammy; fruit an aggregation of drupelets.....*Rubus odoratus*, p. 113
 5. Leaves and twigs not glandular-clammy; fruit an inflated pod.....*Physocarpus*, p. 93
 4. Older bark close, not separating in layers
 6. Leaves glandular beneath; petiole short; spines generally present; fruit a smooth or prickly berry.....*Ribes*, p. 85
 6. Leaves not glandular beneath, 1-3 dm. in diameter; spines present on midrib; petioles long; flowers greenish-white in panicles; fruit a 2-seeded drupe.....*Fatsia*, p. 173
 3. Leaves and veins not as above
 7. Leaves pinnately lobed
 8. Leaves with numerous deep, rounded lobes on each side of the midrib, sweet-scented shrubs; fruit small, nut-like.....*Myrica asplenifolia*, p. 72
 8. Leaves with few to several shallow, rounded or pointed lobes on each side of the midrib; not sweet-scented
 9. Leaves 1-2 dm. long; buds clustered at ends of branches; fruit an acorn.....*Quercus*, p. 79
 9. Leaves 2-13 cm. long, buds not clustered at ends of twigs; fruit a small pome.....*Crataegus*, p. 102
 7. Leaves not pinnately lobed, but irregularly lobed; buds scaly.....*Crataegus*, p. 102
 1. Leaves without lobes
 10. Leaves with entire margins
 11. Leaves generally with a pair of tendrils at the base of the petiole; stems usually with spines or prickles, green and climbing; fruit a blue or black berry.....*Smilax*, p. 53
 11. Leaves without tendrils at base of petiole
 12. Leaves persistent, leathery and sometimes revolute
 13. Stems creeping, prostrate or forming dense, low mats
 14. Stems covered with brown hairs, prostrate or creeping; leaves cordate at base, 2-7 cm. long, oval-oblong; fruit a capsule.....*Epigaea*, p. 189
 14. Stems not covered with brown hairs

15. Leaves glaucous on the lower surface.....*Vaccinium* (cranberries), p. 207
15. Leaves green on the lower surface
 16. Leaves with black dots on the lower surface, thick and leathery, 5-18 mm. long.....*Vaccinium Vitis-Idaea*, p. 205
 16. Leaves without black dots on the lower surface, 1-1.5 cm. long, obovate-spatulate.....*Arctostaphylos*, p. 191
13. Stems erect
 17. Lower surface of leaves covered with dense, woolly, rusty-brown hairs; fruit a capsule*Ledum*, p. 182
 17. Lower surface of leaves not densely covered with rusty-brown hairs
 18. Leaves white on the lower surface, linear-lanceolate, revolute; low shrubs; fruit a capsule.....*Andromeda*, p. 185
 18. Leaves light green on lower surface, leathery, slightly revolute; fruit a subglobose capsule.....*Kalmia*, p. 183
12. Leaves deciduous
 19. Bark and leaves aromatic; flowers yellow, before the leaves which are oblong-obovate and pale beneath; fruit a red obovoid drupe.....*Benzoin*, p. 83
 19. Bark and leaves not aromatic
 20. Branchlets enlarged at the nodes; bark very fibrous and leathery; flowers before the leaves which are oval-obovate; fruit a red ovoid drupe.....*Dirca*, p. 169
 20. Branchlets not enlarged at the nodes
 21. Lateral veins running parallel to the margins of the leaf and ending near the apex; leaves ovate, obovate or oval, 5-9 cm. long, clustered at the ends of the branches; fruit small, globose, blue when ripe.....*Cornus*, p. 175
 21. Lateral veins not running parallel to the margin of the leaf
 22. Leaves 1.5-3 dm. long, not crowded at the end of the lateral branches; fruit 7-13 cm. long, pulpy when ripe.....*Asimina*, p. 181
 22. Leaves smaller
 23. Each bud covered with a single hood-like scale; flowers in catkins.....*Salix*, p. 55
 23. Each bud covered by more than one scale; flowers not in catkins
 24. Petioles 6-12 mm. long; apex of leaf mucronate; fruit red, drupe-like on long pedicels.....*Nemopanthis*, p. 145
 24. Petioles less than 1 cm. long, or none
 25. Lower surface of leaves covered with yellow resinous dots
 26. Leaves when crushed sweet-scented; apex of leaf rounded, often with a few teeth; fruit a waxy drupe.....*Myrica Gale*, p. 72
 26. Leaves not sweet-scented
 27. Fruit a capsule.....*Lyonia*, p. 187
 27. Fruit a berry.....*Gaylussacia*, p. 193
 25. Lower surface of leaves not covered with yellow resinous dots
 28. Branchlets greenish or reddish and minutely white-speckled or hairy; fruit a berry.....*Vaccinium*, p. 195
 28. Branchlets with gray or brownish shreddy bark, not white-speckled or hairy; fruit globular capsules in leafless racemes.....*Lyonia*, p. 187
 10. Leaves with margins not entire, generally dentate, serrate, etc.
 29. Shrubs with thorny branches and twigs
 30. Petioles with glands near the upper end; fruit a drupe.....*Prunus*, p. 129
 30. Petioles without glands near upper end; fruit a pome.....*Crataegus*, p. 102
 29. Shrubs without thorny branches and twigs

31. Stems climbing or twining; vines; leaf margins crenate-serrate;
lateral veins not straight; fruit an orange capsule.....*Celastrus*, p. 149
31. Stems erect; shrubs
 32. Stems low, 1-2 dm., almost herbaceous, from subterranean creeping stems;
leaves persistent, wintergreen flavor; fruit red, berry-like.....*Gaultheria*, p. 191
 32. Stems higher, more than 2 dm.
 33. Leaves with 3 nearly equal veins from near the base;
much branched shrubs; fruit a capsule.....*Ceanothus*, p. 157
 33. Leaves with 1 main vein
 34. Buds with distinct stalks
 35. Leaves crenate-dentate to wavy, base oblique;
fruit a 2-celled, woody pod.....*Hamamelis*, p. 91
 35. Leaves serrate or doubly serrate; base not oblique;
fruit small nutlets in a persistent cone-like
woody structure.....*Alnus*, p. 77
 34. Buds without distinct stalks
 36. Buds naked, leaf base slightly or not at all oblique;
fruit berry-like.....*Rhamnus*, p. 155
 36. Buds with scales
 37. Each bud covered with one hood-like scale.....*Salix*, p. 55
 37. Each bud covered with two or more scales
 38. Leaves variously lobed or coarsely serrate
 39. Leaves short and broad; shrub thorny;
fruit a pome.....*Crataegus*, p. 102
 39. Leaves elongated; shrub not thorny;
fruit an acorn.....*Quercus*, p. 79
 38. Leaves not as above
 40. Base of leaf broad, rounded, cordate or
subcordate
 41. Leaf margins evenly and simply
serrate, dentate or crenate
 42. Leaves 3-8 cm. long, not waxy
on the upper surface; fruit
a berry-like pome.....*Amelanchier*, p. 99
 42. Leaves 4-8 cm. long, waxy on
the upper surface; fruit a
berry-like pome.....*Pyrus*, p. 97
 41. Leaf margins unevenly and mostly
doubly serrate or dentate
 43. Bark on young stems with trans-
versely elongated lenticels;
fruit a samara in
cone-like catkins.....*Betula*, p. 75
 43. Bark without lenticels; leaves
ovate or ovate-oblong, not
taper pointed, hairy; branchlets
with bristly hairs; fruit a
nut within a husk-like
involucre.....*Corylus*, p. 73
 40. Base of leaf tapering or acute
 44. Lower surface of leaves covered
with yellow glands, scurf or dots
 45. Leaves sweet-scented when
crushed, mostly entire towards
the base, lower surface cov-
ered with yellow resinous
glands; fruit a waxy
drupe.....*Myrica Gale*, p. 72
 45. Leaves not sweet scented (46)

46. Leaves coriaceous, persistent, lower surface covered with yellowish
 short; fruit a capsule in one-sided, leafy racemes.....*Chamaedaphne*, p. 189
46. Leaves not coriaceous, deciduous, lower surface covered with
 yellowish resin globules; fruit berry-like.....*Gaylussacia*, p. 193
47. Lower surface of leaves not covered with yellow glands or dots
 47. Midrib of leaf with dark glands on the upper surface;
 fruit a berry-like pome.....*Pyrus*, p. 97
47. Midrib of leaf without dark glands
48. Fruit fleshy
49. Stipules small, sharp and persistent, nearly black,
 fruit red, in clusters, berry-like.....*Ilex*, p. 144
49. Stipules not as above; fruit black, berry-like.....*Rhamnus*, p. 155
48. Fruit a dry capsule or follicle
50. Leaves serrate or doubly serrate; fruit follicular,
 in corymbs or panicles.....*Spiraea*, p. 95
50. Leaves serrulate; fruit a 5-valved capsule
 borne in open clusters.....*Lyonia*, p. 187

The Shrubs of Michigan

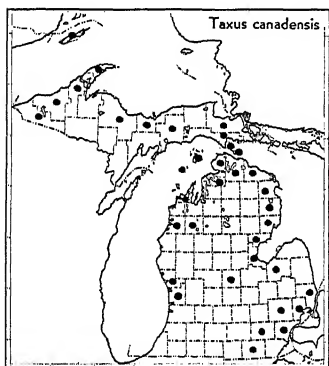
TAXACEAE—YEW FAMILY

Trees or shrubs with alternate, evergreen, linear leaves; flowers dioecious, or rarely monoecious, borne on short scaly peduncles, the sterile globular, consisting of a few naked stamens with anther cells, the fertile consisting of an erect ovule which becomes a bony-coated seed, furnished with a fleshy outer disk.

Only the following genus occurs in Michigan.

Taxus [Tourn.] L.—YEWS

Taxus canadensis Marsh. (American Yew, Ground Hemlock). Fig. 1. A low, straggling evergreen shrub, rarely more than 1 meter high; leaves flat, pointed, 10-25 mm. long; 1-2 mm. wide, rigid, green on both sides, bitter, spiral on the branches, appearing two-ranked. Flowers in early spring, dioecious or monoecious, solitary in the axils of the leaves of the previous year's growth. Fruit a nut-like chestnut-brown bony seed, about 5 mm. long, nearly enclosed when ripe in a coral-red, pulpy, berry-like cup; ripe in midsummer.



Commonly in evergreen woods from Newfoundland to Virginia, west to Iowa and Manitoba. Michigan, throughout.

In Michigan the American Yew is often found in deep cedar swamps and bogs, like some of our herbaceous plants, apparently entirely out of its natural habitat. The generic name *Taxus* is derived from the Greek word *taxon*, meaning bow. It is said that the Indians often made their bows of its wood. The American Yew characteristically appears to be healthy and vigorous, and when bearing the translucent red fruits artistically arranged among the dark green leaves it makes a most beautiful appearance.

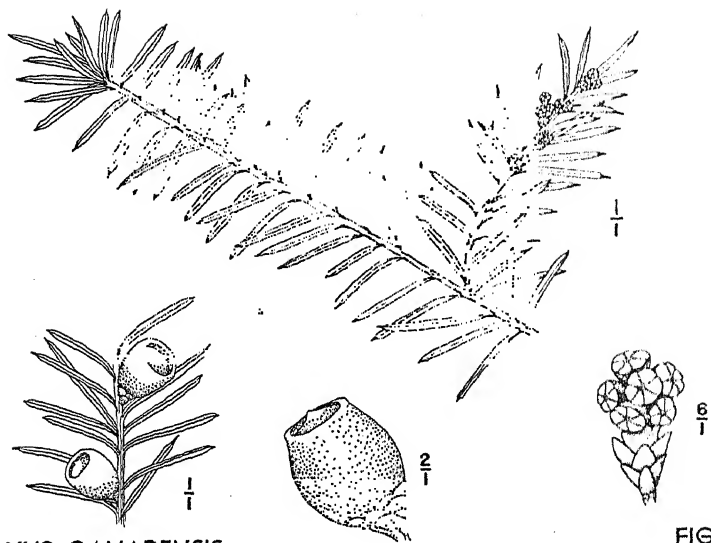
PINACEAE—PINE FAMILY

Mostly evergreen trees, or rarely shrubs, with resinous juice; leaves mostly awl-shaped or needle-shaped, entire; flowers monoecious or rarely dioecious, borne in or having the form of scaly catkins, of which the fertile become cones or berry-like; ovules 2 or more at the base of each scale.

Juniperus is the only genus of this family in Michigan which includes plants that may be classified as shrubs.

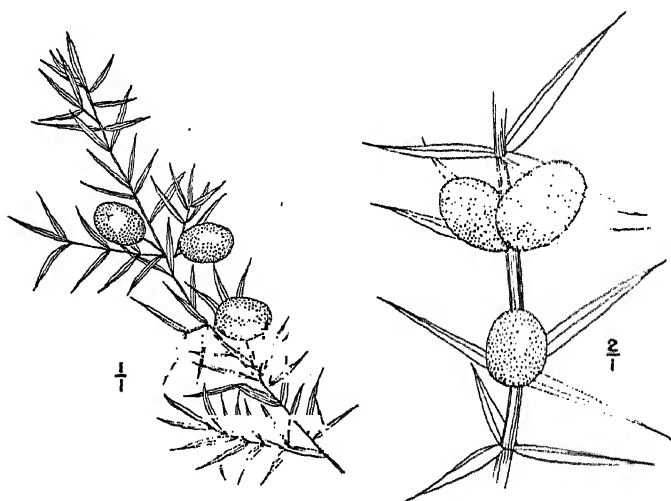
Juniperus [Tourn.] L.—JUNIPERS

Decumbent shrub forming large mats; leaves in whorls of three, linear, prickly pointed.....*J. communis* var. *depressa*, p. 51
Trailing shrub; leaves mostly scale-like.....*J. horizontalis*, p. 51



TAXUS CANADENSIS

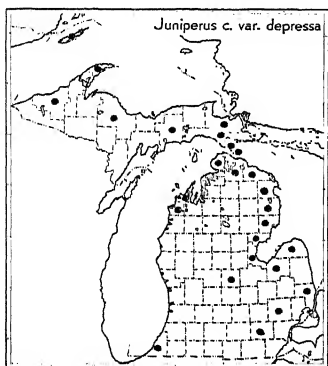
FIG. 1



JUNIPERUS COMMUNIS VAR. DEPRESSA

FIG. 2

Juniperus communis L. var. *depressa* Pursh. (Prostrate Juniper). Fig. 2. Low spreading evergreen shrub about 1 m. high and often several m. in



diameter; leaves 8-13 mm. long, 1-1.5 mm. wide, straight or nearly so, sharp-pointed with a white stripe beneath; flowers in the axils of the younger branches, opening in the early spring; fruit resembling a berry, 6-10 mm. in diameter, sweet, fleshy, aromatic, ripening in the autumn of the third year.

Common in poor rocky soil and pastures from Labrador to British Columbia, south to Massachusetts, New York, along the Great Lakes and in the Rocky Mountains to Colorado and Utah. Michigan, throughout.

The seeds of the Prostrate Juniper seem to germinate easily and a community of these shrubs is apt to contain a large proportion of young plants in all sizes which

are easy to transplant. The berries are used in making gin. They also have medicinal qualities and are used as a diuretic.

Juniperus horizontalis Moench. (Creeping Juniper). Fig. 3. Prostrate, evergreen shrub, sometimes spreading over a considerable area; leaves bluish-



green, scale-like, with a sharp point, or occasionally awl-shaped on young strong-growing shoots; flowers early spring; fruit a dark fleshy berry, ripening during the second summer.

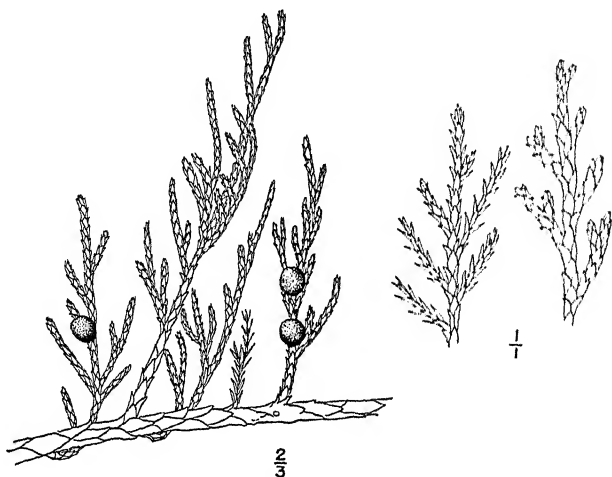
Rocky or sandy shores and banks, borders of swamps, etc., Newfoundland to New England, New York, northern Michigan, Minnesota and northward. Michigan, shores of Upper Peninsula and the northern part of the Lower Peninsula.

To those who are accustomed to thinking of evergreens only as trees or upright shrubs it is a curious sight to see the long, creeping branches of this Juniper spreading among the other vegetation near the shores of the

lakes and swamps of the northern Michigan counties. It belongs strictly to the north and unlike some other such species it seems never to have adopted the bogs of our southern counties as a habitat.

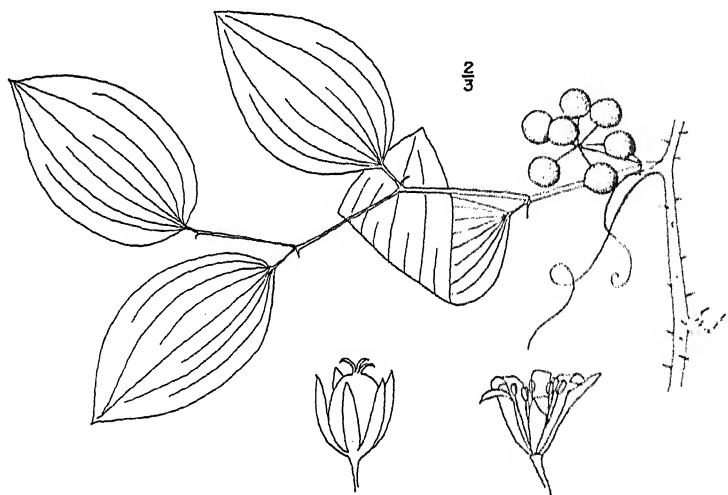
LILIACEAE—LILY FAMILY

Herbaceous or woody plants and vines; leaves deciduous, alternate, simple, various in outline; flowers regular, mostly perfect with a 6-parted perianth arranged in two circles; stamens 6, one before each of the divisions of the perianth; carpels 3, united; ovary 3-celled; fruit a few-to-many-seeded pod or berry.



JUNIPERUS HORIZONTALIS

FIG. 3



SMILAX ROTUNDIFOLIA

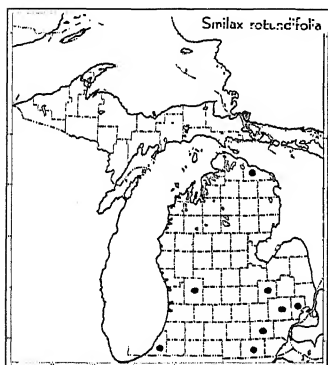
FIG. 4

The lily family is represented by many genera and species in Michigan. Only the following genus, however, contains plants which may be classified as shrubs.

Smilax [Tourn.] L.—GREENBRIERS

Flower stem shorter or hardly longer than the petioles;
leaves thickened; berries blue-black.....*S. rotundifolia*
Flower stem 2-4 times the length of the petioles;
leaves thin or thinnish; berries black.....*S. hispida*

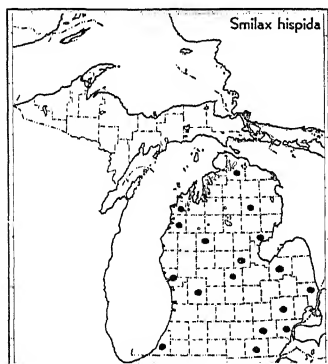
Smilax rotundifolia L. (Common Greenbrier, Horse Brier). Fig. 4. Climbing woody vines, the stems and branches terete, prickly with scattered spines



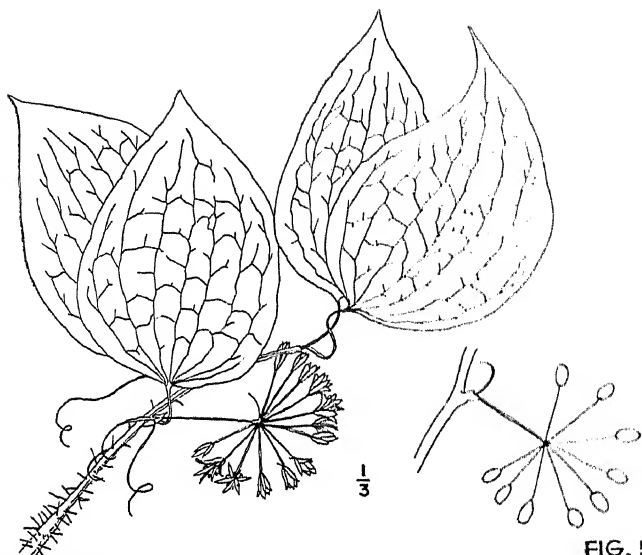
up to 1 cm. in length, glabrous; branchlets zigzag, more or less 4-angular; leaves deciduous, simple, alternate, ovate or round-ovate, often broader than long, slightly cordate at the base, acute or acuminate at the apex, entire or obscurely denticulate, 5 nerved, 5-15 cm. long, green both sides, thick and shining when mature; petioles 6-12 mm. long with a pair of tendrils at their base by which the plant climbs; flowers dioecious, in 6-25 flowered umbels, small greenish or yellowish, regular, the perianth segments all distinct and deciduous, pubescent at the tip; filaments 2-3 times as long as the anthers; peduncles flattened, generally shorter than the petioles; pedicels 2-8 mm. long; berries blue-black with a bloom, 6-8 mm. in diameter, 1-3 seeded. Flowers, June; fruit ripe October and November.

Moist thickets and in woods, Nova Scotia, Ontario to Minnesota, Florida and Texas. Michigan, infrequent southern peninsula.

This *Smilax* is very variable, passing into the named variety *quadrangularis* (Muhl.) Wood. which has branches and especially branchlets 4-angular, and is more common westward. I have collected the variety in Berrien County and the branches were square enough to have been mechanically shaped.



Smilax hispida Muhl. (Hispid Greenbrier). Fig. 5. Stems glabrous, long and climbing, the lower and older parts generally thickly beset with long and weak blackish bristly prickles, the flowering branchlets mostly naked; leaves deciduous, simple, thin, dark-green and shining both sides, ovate, abruptly acute and cuspidate at the apex, obtuse or subcordate at the base, 7 nerved, 5-13 cm. long, rough-margined; petioles 8-18



SMILAX HISPIDA

FIG. 5



SALIX LUCIDA

FIG. 6

mm. long, tendril-bearing; flowers dioecious in 6-25 flowered umbels, small, greenish or yellowish, regular, the perianth segments lanceolate, nearly 6 mm. long, distinct and deciduous; filaments a little longer than the anthers; peduncles flattened, 2-4 times as long as the petioles; pedicels 4-10 mm. long; berries globose, black without a bloom, 6-8 mm. in diameter; 1-seeded, or rarely with 2 seeds. Flowers, June; fruit, October, November.

Moist thickets Connecticut to Virginia, west to Ontario, Minnesota, Kansas and Texas. Michigan, throughout.

The Hispid Greenbrier is widely distributed in both peninsulas of Michigan and is a familiar vine in thickets generally. The attractive fruit is frequently used in winter bouquets.

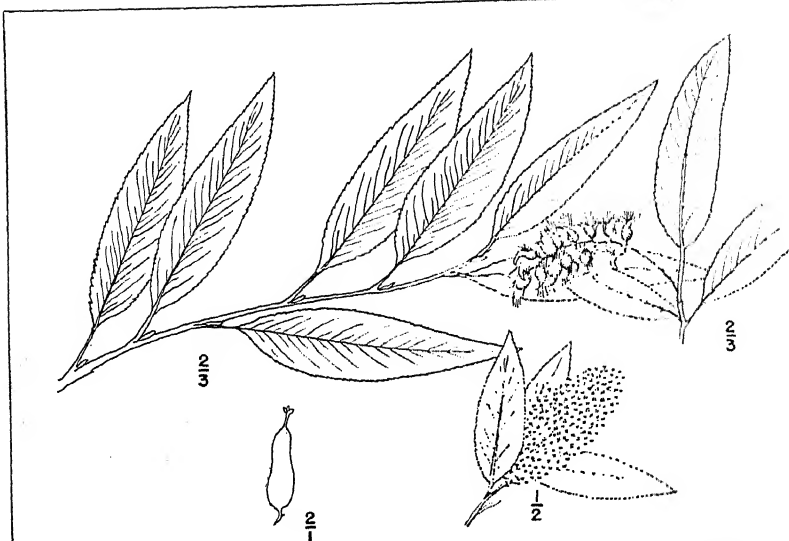
SALICACEAE—WILLOW FAMILY

Trees or shrubs with bitter bark and alternate, simple leaves; flowers dioecious, both kinds in catkins, each flower subtended by a bract, without perianth, the staminate with two to many stamens, the pistillate with a single compound pistil composed of two carpels and two more or less divided stigmas. At maturity the pistil opens setting free the small seeds which are furnished with long silky down. The family includes two genera, *Salix*, the willows, and *Populus*, the aspens and poplars, or cottonwoods. None of the latter are classed as shrubs in Michigan and are therefore not treated here.

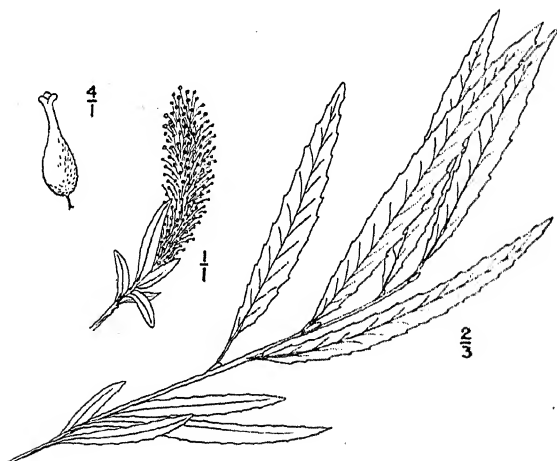
Salix [Tourn.] L.—WILLOWS

Salix is a very large genus of trees and shrubs, varying in size from the giant willow trees of the river banks and low lands to the alpine forms scarcely more than a centimeter in height. The willow hybridizes naturally, and it is this which makes the determination of the different species so difficult. For the purpose of the beginner it is felt that it would be confusing and might lead to discouragement to include the many forms and varieties which have been studied by the experts and given names. Therefore only a few of the more stable species are listed. To those who wish to study the willows in more detail there are available the regular botanical manuals and several monographs, the names of which will gladly be furnished.

1. Catkins borne on short lateral leafy branchlets; scales yellowish, deciduous; style short or obsolete; stigmas thick, notched
 2. Stamens 3 or more
 3. Leaves green both sides, with long-acuminate curved tips; fruit mature early summer; capsule conic-ovoid.....*S. lucida*, p. 57
 3. Leaves pale or white beneath, short-acuminate; fruit mature in autumn; capsule conic-subulate.....*S. serissima*, p. 59
 2. Stamens 2; leaves linear, tapering at each end, remotely denticulate; capsule blunt, short-pedicelled; stigmas large, sessile.....*S. longifolia*, p. 59
1. Catkins lateral or terminal; scales persistent, colored at the tip; erect or ascending shrubs
 4. Capsules glabrous
 5. Stipules persistent, conspicuous
 6. Leaves oblong-lanceolate, dull above; stipules generally large, serrate; capsule greenish.....*S. cordata*, p. 59
 6. Leaves ovate or obovate, shining above, glandular-serrate; stipules large, ear-shaped, dentate; capsule attenuate-beaked.....*S. glaucophylla*, p. 61



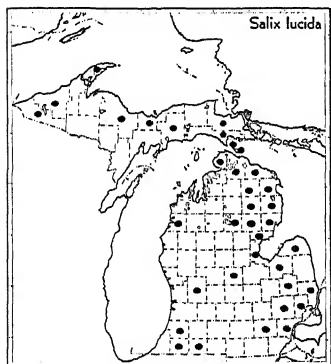
SALIX SERISSIMA



SALIX LONGIFOLIA

5. Stipules obsolete or minute
 7. Leaves glabrous or quickly glabrate
 8. Leaves short-oval, glandular-serrate, mostly subcordate at base, dark green above, glabrous; capsule very narrow, acute; style very short.....*S. balsamifera* p. 61
 8. Leaves oblong-linear, entire, obtuse, acutish at base, smooth both sides; capsule oblong-conic, reddish-green*S. pedicellaris*, p. 61
 7. Leaves covered with long silky tomentum on both sides, ovate or broadly lanceolate, finely serrate; stipules conspicuous, ovate-cordate, glandular-serrate; capsule subsessile..*S. syrticola*, p. 63
4. Capsules pubescent
 9. Catkins sessile on old wood, naked at base, appearing before the leaves
 10. Mature leaves glabrous or glabrate beneath
 11. Leaves lanceolate to elliptic, smooth and bright-green above, becoming smooth and glaucous.....*S. discolor*, p. 65
 11. Leaves narrowly lanceolate, taper-pointed, finely serrate, soon glabrous; mature capsule 4-6 mm. long, ovoid at base, beaked.....*S. petiolaris*, p. 65
 10. Mature leaves pubescent at least beneath
 12. Leaves dull grayish-tomentose; capsule slender-beaked
 13. Leaves oblong-lanceolate, 5-15 cm. long; stipules medium, semi-ovate, entire or toothed.....*S. humilis*, p. 67
 13. Leaves linear-oblancoate, 1-5 cm. long; stipules minute, deciduous.....*S. tristis*, p. 67
 12. Leaves lustrous beneath, minutely silky-pubescent, narrowly lanceolate, 0.4-1 dm. long, finely serrate; capsule blunt, ovoid-oblong, 4 mm. long.....*S. sericea*, p. 69
 9. Catkins leafy-bracted at base, appearing with the leaves
 14. Leaves obovate to elliptic-lanceolate, strongly wrinkled in age, grayish-pubescent or glabrate beneath; capsule gray-pubescent, long-pedicelled and long, slender-beaked, style nearly obsolete.....*S. rostrata*, p. 69
 14. Leaves oblong to linear-lanceolate, covered with a dense white tomentum beneath, becoming glabrate above; capsule ovoid-conic, acute, densely white-woolly; style dark-red.....*S. candida*, p. 71

***Salix lucida* Muhl. (Shining Willow).** Fig. 6. Tall shrub, 1-3 m. high; bark brown, smooth or somewhat scaly; twigs yellowish-brown and glossy; leaves alternate, simple, deciduous, ovate-lanceolate or narrower, 5-15 cm. long, finely and evenly serrate, rusty-pubescent when very young, in maturity thick, leathery, glabrous, green and shining on both sides; stipules small, oblong or semicircular, generally persistent; catkins appearing with the leaves on short leafy branches, staminate 2-5 cm. long, fertile becoming 3-5 cm. long in fruit; capsule rounded at base, 4-5-6.5 mm. long, pale-brown or greenish; style about 0.5 mm. long, entire; stigmas short, thick. Flowers, April, May; fruit, June.

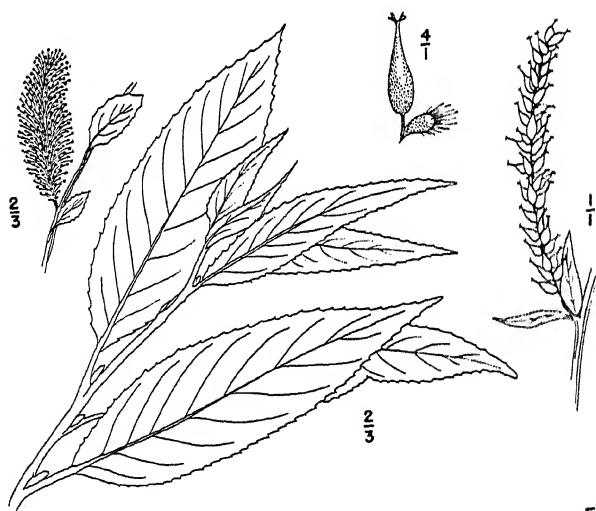


The Shining Willow is found along the banks of streams, lakes and in roadside ditches from Newfoundland to Manitoba, south to Pennsylvania, Illinois and Nebraska. Michigan, common throughout. This is a most beautiful willow and adds materially to our natural landscape.



SALIX CORDATA

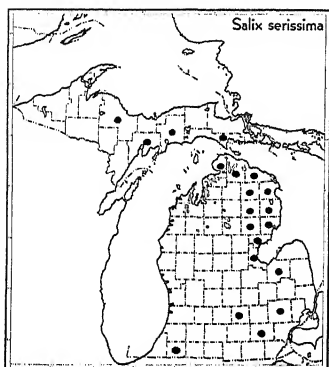
FIG. 9



SALIX GLAUCOPHYLLA

FIG. 10

Salix serissima (Bailey.) Fernald. (Autumn Willow). Fig. 7. A shrub 1-4 m. high; bark olive-brown and shining; stipules none; leaves simple, alternate, deciduous, elliptic or oblong-lanceolate,



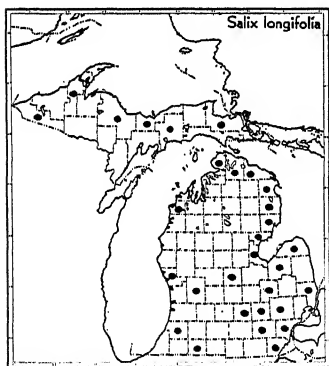
short-acuminate, rounded at the base, 4-8 cm. long, 1-3 cm. broad, closely serrulate, glabrous, dark-green and shining above, pale or whitish beneath; catkins appearing with the leaves, on short leafy twigs, staminate 1-1.5 cm. long, the fertile becoming loosely flowered, 2-3.5 cm. long, scales obovate, pale yellow; capsule narrowly conical, olive- or brown-tinged, 7-10 mm. long, glabrous, ripe in late autumn, the pedicel twice exceeding the gland; style short and thick. Flowers, June, July; fruit persistent until autumn.

The range of the Autumn Willow is from Quebec to New Jersey, west to Alberta and Minnesota. It is found in bogs and swamps,

mostly in calcareous regions. Michigan, throughout.

The Autumn Willow is so named because of its late flowering.

Salix longifolia Muhl. (Sandbar Willow, Longleaf Willow). Fig. 8. A shrub with clustered stems 1.5-4 m. tall, or sometimes higher; bark grayish; branchlets reddish-brown, usually glabrous;

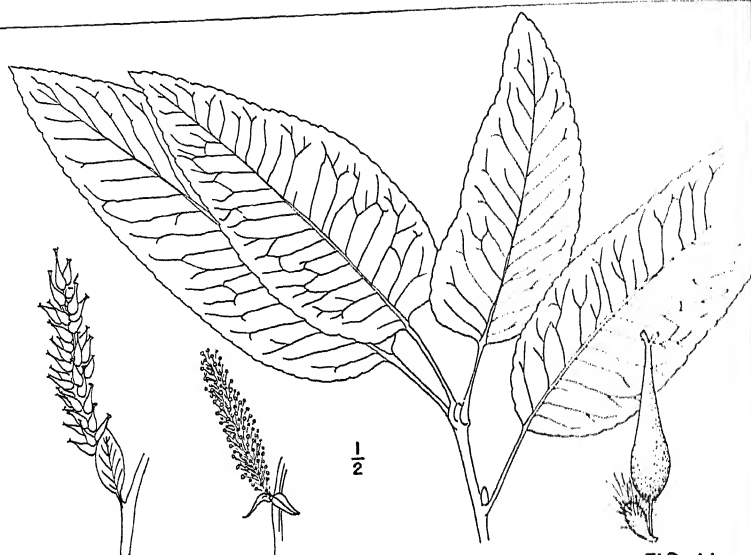


stipules mostly lacking; leaves simple, alternate, deciduous, linear or oblong-lanceolate, 3-15 cm. long, 4-15 mm. broad, tapering at each end, nearly sessile, more or less silky when young, at length smooth and green both sides, the margin with widely spaced, slender, sharp teeth; catkins appearing with or after the leaves; staminate clustered at the tips of slender branches, 1.5-3 cm. long, 5-8 mm. wide, the pistillate solitary at the ends of rather long leafy shoots, loosely flowered, scales lanceolate, thinly pubescent, yellow, deciduous; capsule short-pedicelled, blunt; stigmas large, very short, divided. Flowers, April, May; fruit into July.

This willow ranges from Quebec to Manitoba, south to Delaware and Louisiana. Michigan, common throughout.

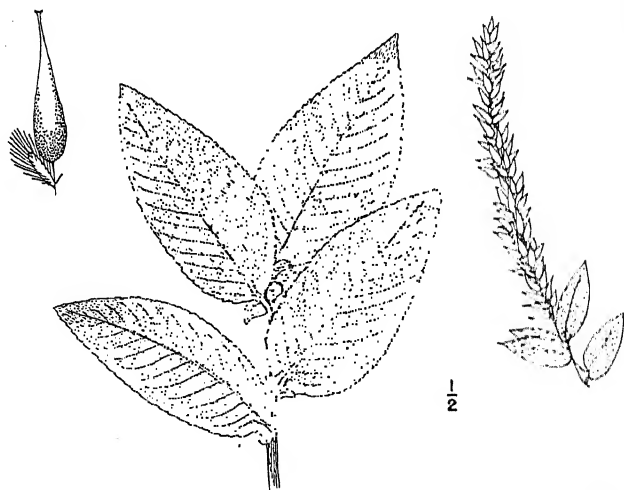
The Sandbar Willow is usually found in rich alluvial deposits or in places subject to flooding and it is for this reason that it has received one of its common names.

Salix cordata Muhl. (Heartleaf Willow). Fig. 9. A shrub 1.5-3.5 m. high, usually with several stems; twigs green or brown, puberulent or pubescent when young; stipules semi-cordate or nearly round; leaves alternate, simple, deciduous, oblong-lanceolate or narrowly lanceolate, 4-12 cm. long, 1-4 cm. wide,



SALIX BALSAMIFERA

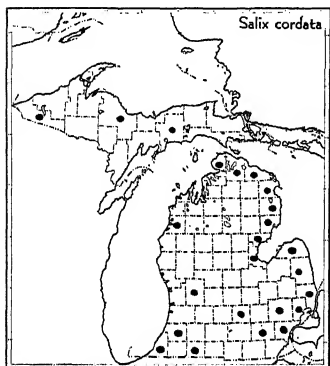
FIG. 11



SALIX SYRTICOLA

FIG. 12

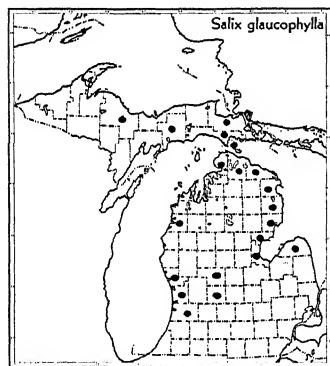
rounded to subcordate at base, sharply serrulate, dark-green above, slightly paler beneath, strongly nerved with age; catkins appearing with the leaves, 2-6 cm. long, rather slender; scales generally very pubescent, persistent; capsule narrowly ovoid, glabrous, 4-5 mm. long, short-pedicelled. Flowers, April, May; fruit through May.



In wet places along streams and ditches from New Brunswick to Maryland, west to Manitoba and eastern Kansas. Michigan, common throughout.

This is a characteristic shrub of the water courses. It hybridizes freely and has several named varieties and forms.

Salix glaucophylla Bebb. (Broadleaf Willow). Fig. 10. A shrub 1-3 m. high; stems clustered; twigs yellowish to dark-brown, pubescent, becoming glabrous; stipules 3-10 mm. long, ear-shaped, serrate, persistent; leaves simple, alternate, deciduous, ovate, obovate, oblong-lanceolate, broadly rounded at the base, 4.5-12 cm. long, 2-4.5 cm. wide, short-acuminate at the apex, glandular-serrate, firm, dark-green and shining above, white-glaucous beneath, glabrous throughout; petiole stout, 6-12 mm. long; catkins appearing before the leaves, with a leafy bract at the base, the staminate 3-5 cm. long, the pistillate 4-7 cm. long in fruit; bracts densely white-villous, persistent; style filiform; capsule slender-beaked, 9-11 mm. long, glabrous; pedicel slender, 2-4 mm. long. Flowers, April, May; fruit May and early June.



Found on sandy or alluvial shores of rivers and lakes eastern Quebec and New Brunswick to Alberta, south to Maine, northern Ohio, Illinois and Wisconsin. Michigan, throughout, but mostly along the shores; rare in the interior.

The sand dunes and ridges of the Great Lakes are the chosen habitats of the Broadleaf Willow. When growing in the shifting sand of the dunes it roots readily at the nodes, sending new shoots into the air while the roots take hold of the sand. It thus forms extensive thickets which are useful in holding the sand. Like most of the willows it is not constant and several varieties have been named.

Salix balsamifera Barratt. (Balsam Willow). Fig. 11. A much-branched shrub, 1-2.5 m. high, or rarely a small tree up to 7 m. in height; bark of old stems smooth, dull gray, branches olive; young twigs glabrous, reddish-brown, shining; leaves alternate, simple, deciduous, elliptic, ovate-oval to oblong-lanceolate, thin, glabrous, broadly rounded and mostly subcordate at the base, acute



SALIX PEDICELLARIS

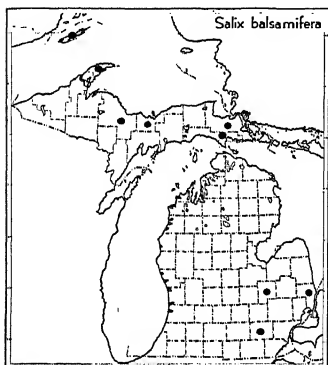
FIG. 13



SALIX DISCOLOR

FIG. 14

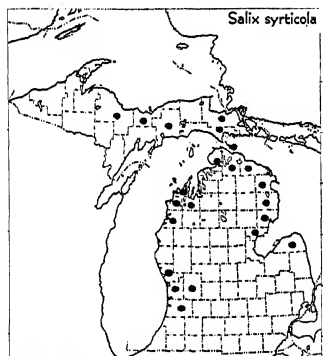
or obtuse at the apex, dark-green above, glaucous and strongly reticulate-veined below, 5-8 cm. long, 2-4 cm. wide, slightly glandular-serrate; petiole slender, 6-12 mm. long; stipules minute or wanting; catkins appearing with the leaves, leafy-bracted at the base, cylindric, the staminate about 2 cm. long, dense, the pistillate 5-7 cm. long, very lax in fruit; bracts villous, persistent; style very short; stamens 2; filaments glabrous; capsule very narrow, acute, 4-5 mm. long; pedicel long and slender. Flowers, May; fruit, June.



In swamps, low woods and thickets Newfoundland, Labrador to Manitoba and British Columbia, south to Maine, New York, Michigan and Minnesota. Michigan throughout.

In flower the Balsam is one of the most beautiful willows. When growing in swampy ground in full sunshine it produces large, broad clumps and when so situated assumes its finest form.

Salix syrticola Fernald. (Furry Willow). Fig. 12. A straggling shrub, 1-3 m. high, with short, tomentose twigs; stipules conspicuous, ovate-cordate, glandular-serrate, exceeding the short, stout petioles; leaves simple, alternate, deciduous,



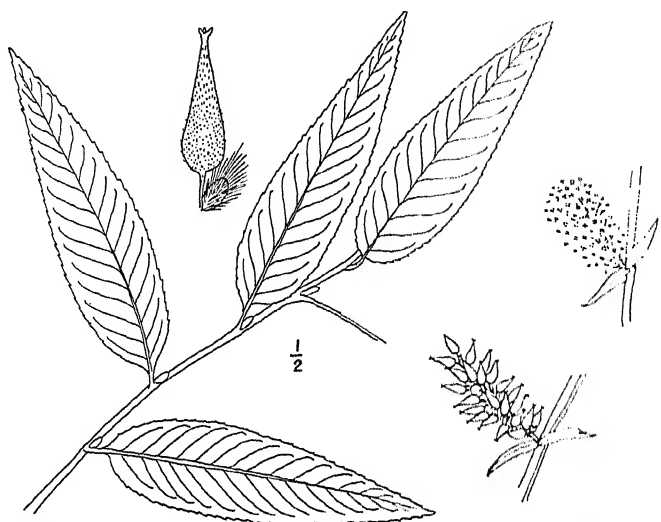
broadly ovate to ovate or ovate-lanceolate, cuspidate-acuminate, cordate or broadly rounded at base, 4-8 cm. long, 1.5-3 cm. wide, very closely serrate with fine projecting gland-tipped teeth, clothed with a long, silky tomentum, even when full grown, deep green on both sides, prominent nerves beneath; catkins appearing with the leaves, on pubescent peduncles, 1-2.5 cm. long bearing several small leaves; pistillate 2-4 cm. long in flower, 6-8 cm. long in fruit; capsule when mature 5-8 mm. long, glabrous; pedicel short, glabrous; stigma entire, scales all oblong, pale-brown, densely covered with long

hairs; staminate catkins 2-4 cm. long, stamens 2, filaments glabrous. Flowers, April, May; fruit, May, June.

'Gray's Manual' gives the range of this willow as: "Shores of the Great Lakes." In Michigan, all records except that from Kent are from the counties bordering the lakes.

The Furry Willow is well named as the whole shrub is covered with a coat of woolly hairs which give it a very striking appearance.

Salix pedicellaris Pursh. (Bog Willow). Fig. 13. Low, 0.5-2 m. high glabrous throughout; bark on older stems brown; branchlets dark-brown; stipules



SALIX PETIOLARIS

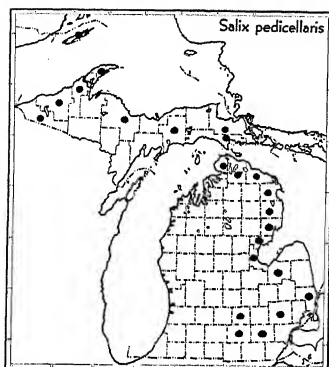
FIG. 15



SALIX HUMILIS

FIG. 16

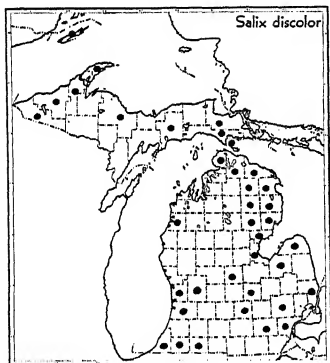
obsolete; leaves simple, alternate, deciduous, 1.5-7 cm. long, obtuse or somewhat pointed, narrowed at base, entire, smooth on both sides, thickish, leathery



when mature, revolute, reticulated on both sides, pale or glaucous beneath; fertile catkins thick-cylindric, loosely few-flowered, borne on long, leafy peduncles, appearing with the leaves; scales obovate-oval, obtuse or acutish, glabrous or glabrate, greenish-yellow; capsule reddish-green, lanceolate; stigmas short, thick, entire; stamens 2, filaments free. (*Salix myrtilloides* of other authors.) Flowers, April, May; fruit, May, June.

Cold bogs, eastern Quebec to British Columbia, New Jersey, Pennsylvania and northern Iowa; also Idaho and Washington. Michigan, recorded from both the Upper and Lower Peninsulas; frequent throughout.

***Salix discolor* Muhl.** (Pussy Willow, Glaucous Willow). Fig. 14. Shrub, or sometimes becoming a small tree; bark thin, smooth, or somewhat scaly, dark-gray; twigs light to dark-brown, sometimes pubescent; buds large with glossy scales; stipules large and sharply toothed or entire; leaves simple, alternate, deciduous, lanceolate to elliptic, 5-10 cm. long, 2-3.5 cm. wide, smooth and bright green above, soon smooth and glaucous beneath, or sometimes pubescent when young, margin irregular wavy-toothed or nearly entire; flowers appearing before the leaves in very early spring; staminate catkins thick-cylindrical, sessile on the old wood, dense, with long silky hairs; pistillate catkins sessile or with a few small leaves on the peduncles, becoming 4-6 cm. long in fruit; scales persistent, long silky-hairy; mature capsule 5-7 mm. long, tomentose; pedicel short, slender; styles short, but distinct. Flowers, April; fruit, May, June.

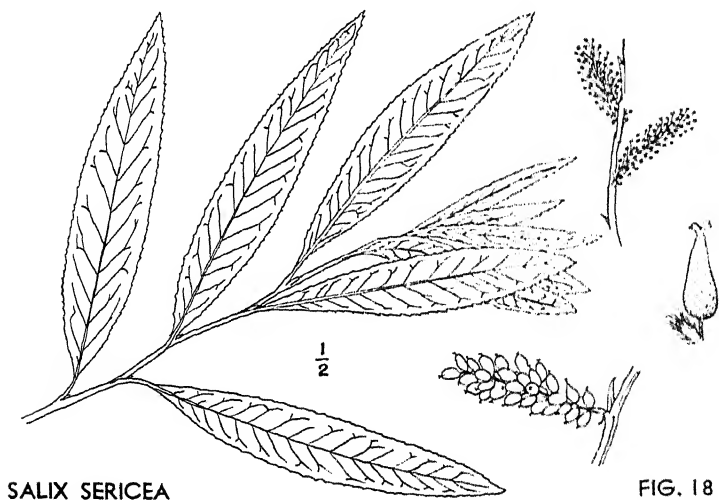
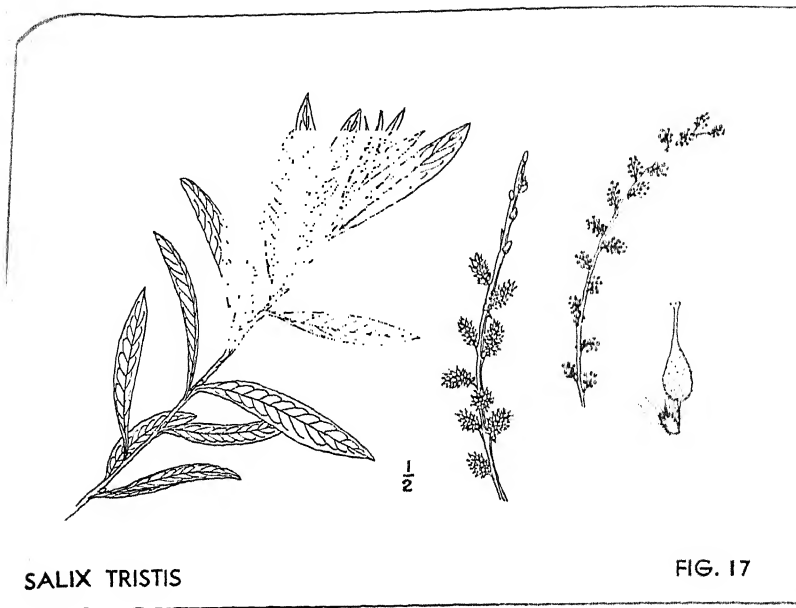


The Pussy Willow grows in swamps and wet places from Newfoundland and Nova Scotia south to Delaware, Kentucky, north-

ern Missouri, west to North Dakota and Saskatchewan. Michigan, frequent throughout.

The furry catkins of this willow creeping out from under their protecting scales early in the spring is a cheerful sight, as they herald the arrival of spring.

***Salix petiolaris* Sm.** (Slender Willow). Fig. 15. Shrub 1-3 m. high, much branched; twigs slender, dark-brown or purplish, glabrous to puberulent; leaves simple, alternate, deciduous, narrowly lanceolate, taper pointed, 3-9 cm. long, 6-12 mm. wide, narrowed or rounded at base, finely and evenly serrate, slightly silky when young, soon smooth, finely reticulate on both sides in age; petiole



6-12 mm. long; stipules linear or semiheart-shaped, deciduous; catkins appearing before the leaves, the staminate obovoid 1-2 cm. long, bracteate, the pistillate ovoid-cylindric, at first 1-2 cm. long, in fruit broad and loose from the lengthening of the pedicels, becoming 2-4 cm. long; scales persistent, pubescent; capsule 4-6 mm. long, conic-ovoid, sparingly silvery-pubescent; pedicels, slender 1.5-3 mm. long; stigmas nearly sessile, lobed. Flowers, May; fruit, June.

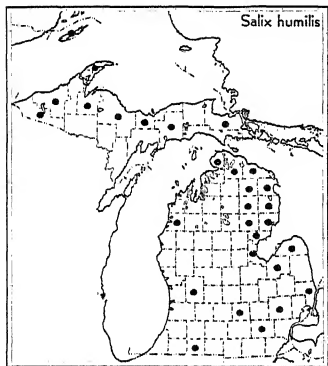
Damp soil New Brunswick to the Great Lakes region and Manitoba, south to Tennessee. Michigan, frequent throughout.



Salix humilis Marsh. (Prairie Willow).

Fig. 16. Shrubs with clustered stems, 1-3 m. high; branchlets yellowish to brown, more or less puberulent or glabrate; stipules medium-sized, semi-ovate, entire or toothed; petioles distinct, 2-8 mm. long; leaves simple, alternate, deciduous, oblanceolate or oblong-lanceolate, 5-15 cm. long, 8-25 mm. wide, narrowed at base, acute or abruptly short-acuminate at the apex, entire or undulate, or undulate-serrate, revolute, downy above, becoming glabrate, glaucous beneath, rugose-veined and softly tomentose; catkins appearing before the leaves on the old wood, numerous, sessile, the staminate ovoid-cylindric, 1-1.5 cm. long, the pistillate ovoid, 1.5-2 cm. long, becoming 2-4 cm. long in fruit, which ripens almost before the leaves appear; scales persistent with long silky pubescence; capsule slender, long-beaked, 8-9 mm. long, tomentose; pedicel about as long as the scale; style very short, entire; stigmas short, divided. Flowers, April, May; fruit, May.

The range of the Prairie or Upland Willow is from Newfoundland to Minnesota, south to Florida and Texas. Michigan, frequent throughout.



As its common name indicates this willow is a shrub of the dry plains and barrens.

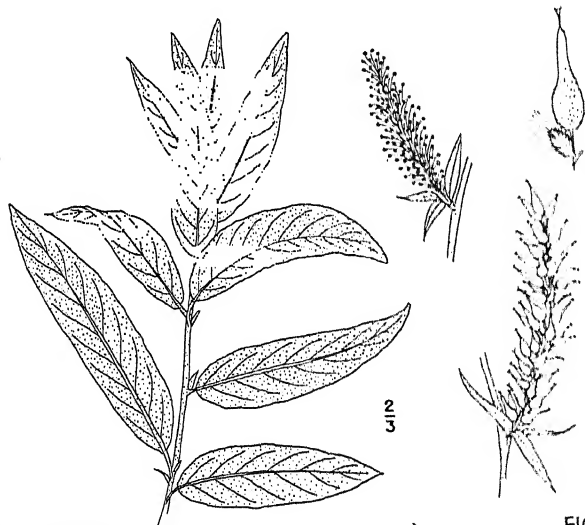
It is noted for the great variety, size and shape of its leaves, and several varieties have been separated and named.

Salix tristis Ait. (Sage Willow, Dwarf Upland Willow). Fig. 17. Low with numerous tufted stems 0.4-1 m. high, closely resembling *Salix humilis*, except that it is smaller in every way; young twigs dingy-puberulent, older twigs dark yellow-brown and glabrate; leaves crowded, narrowly oblanceolate to linear-lanceolate, 1-5 cm. long, 5-12 mm. wide, narrowed at the base, obtuse or acute at the apex, entire with a revolute margin, green and more or less pubescent above, densely white-tomentose below; petiole very short; stipules



SALIX ROSTRATA

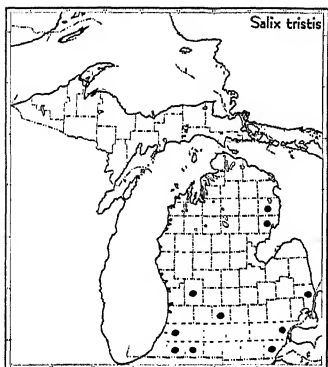
FIG. 19



SALIX CANDIDA

FIG. 20

minute, deciduous; catkins appearing before the leaves, numerous, crowded, 1-1.5 cm. long, sessile, naked, spreading, the fertile becoming 2 cm. long in fruit; scales 1-2 mm. long, hairy; capsule 6-7 mm. long, narrowly conic, with rounded base and long, slender beak; pedicel 1-2 mm. long; stigmas lobed, deeply cleft or nearly entire. Flowers, March, April; fruit, May.



Found on sandy uplands or borders of hillside thickets, roadsides, etc., from Massachusetts to North Dakota, south to Florida, Tennessee, Missouri and eastern Nebraska. Michigan, infrequent; not recorded from the Upper Peninsula.

Salix sericea Marsh. (Silky Willow).

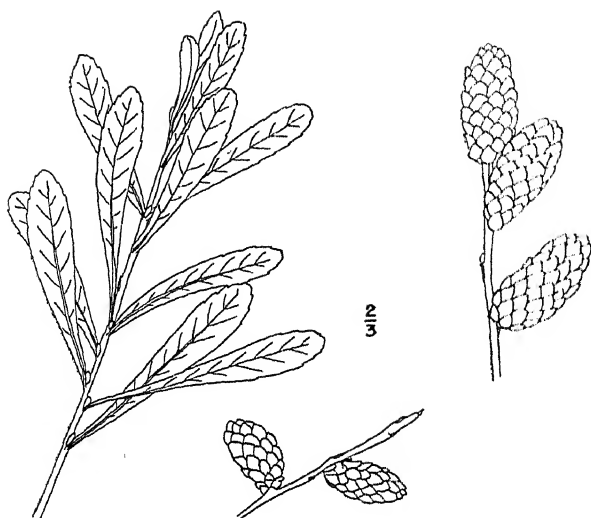
Fig. 18. Stems clustered, 1-3 m. high, light-brown to dark-brown, glabrous or puberulent to pubescent when young; stipules narrow, deciduous; leaves simple, alternate, deciduous, narrowly lanceolate, 0.4-1 dm. long, 1-2 cm. broad, finely serrate, at first very silky beneath, finely reticulate on both surfaces in age; catkins appearing before the leaves, narrowly cylindrical, sessile to subsessile, peduncle sometimes with 2-3 small bracts, staminate 1-2 cm. long, the fertile densely flowered, in maturity 2-3 cm. long; scales ovate or oval and obtuse, dark-brown, long pilose; capsule ovoid-oblong, 3-5 mm. long, blunt, silvery-pubescent, its pedicel about equaling the scale and twice exceeding the gland; style obsolete or very short; stigmas short, notched. Flowers, May; fruit, June.



Wet places New Brunswick west to Michigan and eastern Iowa, south to South Carolina, Kentucky and southeastern Missouri. Michigan, very common central portion of state, also in Upper Peninsula.

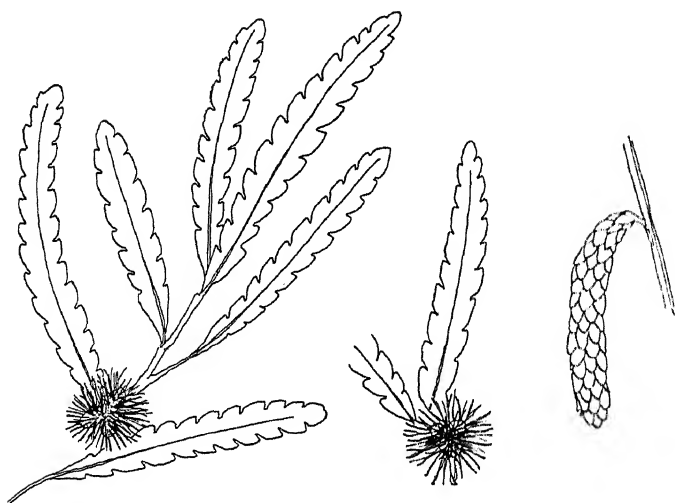
A tall willow with slender, purplish, somewhat downy twigs growing in swamps and along streams.

Salix rostrata Richardson. (Beaked Willow, Bebb's Willow). Fig. 19. Tall shrub, or sometimes a small tree, 2-6 m. high; stems few; branchlets numerous, slender, yellowish to brown, glabrous to pubescent; stipules when present semi-cordate, toothed, acute; leaves simple, alternate, deciduous, obovate to elliptic-lanceolate, 3-10 cm. long, 1.5-2.5 cm. broad, acute or acuminate, dull green and minutely downy above, pale to glaucous and more densely pubescent beneath, serrate, crenate or subentire, thin, becoming rigid; catkins numerous, leafy-bracted at base, appearing with the leaves, the staminate 2-4 cm. long, narrowly cylindrical, very hairy, the fertile loosely flowered, 2-6 cm. long; scales persistent, linear-oblong, pale, rose-tipped, thinly villous; capsule tapering



MYRICA GALE

FIG. 21



MYRICA ASPLENIFOLIA

FIG. 22

to a very long, slender beak, pubescent, about 7 mm. long; pedicel thread-like, much exceeding the scales; style very short; stigmas entire or deeply parted. Flowers, April, May; fruit, June.

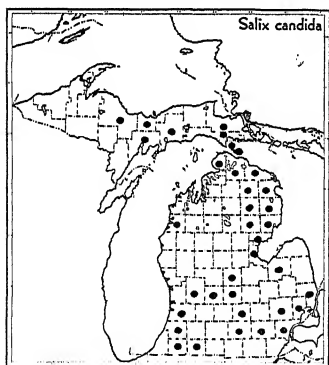


Ranges from Newfoundland to Alaska south to New Jersey, Pennsylvania, Illinois, eastern South Dakota, and in the western mountains to New Mexico and central California. Michigan, common throughout.

Unlike our other willows which grow either in wet ground or in dry ground the Beaked Willow is at home in both dry and wet habitats. As with many other plants two scientific names are in use, the other being *Salix Bebbiana* Sarg.

Salix candida Flüge. (Sage Willow, Hoary Willow). Fig. 20. A hoary shrub

0.5-2 m. high, the young shoots white-woolly, the older, red; stipules lanceolate, about as long as the petioles; leaves oblong to linear-lanceolate, 4-12 cm. long, 5-17 mm. wide, narrowed at the base, acute at the apex, rather rigid, downy above, becoming glabrate, covered with dense white tomentum beneath, the margins revolute and subentire; catkins appearing with the leaves, subsessile, cylindrical, densely flowered, the pistillate 3-5 cm.



long and 1-1.3 cm. wide in fruit; scales obovate, brown, thinly white-pilose; capsule densely white-woolly, lanceolate, short-pedicelled, 6-8 mm. long; style dark red; stigmas short, spreading. Flowers, May; fruit, June.

Cold bogs in glaciated areas from Newfoundland, west to British Columbia, south to New England, New Jersey, the northern parts of Ohio, Indiana, Illinois, Iowa, North and South Dakota and in the Rocky Mountains in Colorado, Wyoming and Montana. Michigan, common throughout.

The Hoary Willow is always conspicuous whether growing in its native habitat or planted as an ornamental in our gardens. Its leaves and young shoots are densely

covered with a white, woolly pubescence which gives it this distinction. Its blossoms are also outstanding and it is entitled to a place in any garden.

MYRICACEAE—SWEET GALE FAMILY

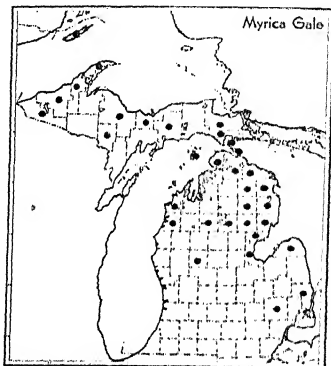
Shrubs with simple, alternate, deciduous, resinous-dotted, aromatic leaves; flowers monoecious or dioecious in short scaly catkins, solitary in the axis of the bract; calyx and corolla none; stamens few-many with short, free or more or less united filaments; ovary 1-celled, ovule 1; style short; stigmas 2; fruit a drupe-like nut.

A family of only the following genus.

Myrica L.—SWEET GALE, SWEET FERN, BAYBERRY, etc.

Leaves only slightly serrate toward the apex.....*M. Gale*
Leaves deeply cut or pinnatifid.....*M. asplenifolia*

Myrica Gale L. (Sweet Gale). Fig. 21. A branching shrub 1-1.5 m. high; leaves simple, alternate, deciduous, wedge-lanceolate, serrate toward the apex, 3-6 cm. long, 8-18 mm. wide, later than the flowers, resinous-dotted, fragrant; flowers in April, mostly dioecious, individual flowers solitary under a scale-like bract, staminate in catkins 10-15 mm. long, pistillate catkins ovoid about 5 mm. long; scales triangular; fruit small, globular or short-cylindric, dry, coated with resinous grains of wax, each nut 2-winged by thick persistent bractlets 2-3 mm. long, ripe July.



From Labrador to Alaska, through the New England and middle states, as far south as Virginia and along the Great Lakes to Minnesota this shrub may be found growing along streams, borders of ponds and in swamps. Michigan, common throughout.

When crushed the leaves of the Sweet Gale feel somewhat resinous and exude a penetrating, rather fragrant odor. They are placed in clothing for the purpose of keeping out moths. The young buds were used for dyeing porcupine quills by the Indians.

Myrica asplenifolia L. (Sweet Fern).

Fig. 22. A low, branching shrub, 3-6 dm. high, sweet-scented, branches pubescent; leaves appearing alternate, simple, deciduous, fern-like, linear-lanceolate, 6-12 cm. long, 10-15 mm. wide, acute or rounded at the apex, narrowed at the base, cut into obtuse or pointed lobes their entire length, sinuses reaching nearly to the midrib, densely sprinkled with minute, yellow, shining resinous dots; flowers in catkins, dioecious or monoecious, staminate about 2 cm. long, clustered at the ends of the branches, pistillate catkins ovoid or globose, at the ends of very short lateral branches, bur-like; ovary 1-celled, surrounded by eight long awl-shaped persistent scales. Flowers, April, May; fruit ripe July, August.



Ranges from New Brunswick to Saskatchewan, south to North Carolina, Indiana and Michigan. Michigan, common except in the southern counties.

Unlike the preceding species which grows in water or very wet places, the Sweet Fern is found only in dry, sandy soil. In the pine country of Michigan

it is one of the most common species. The whole plant gives out a pleasant, spicy odor. The leaves have been used as an ingredient in diet drinks and as a remedy for dysentery.

BETULACEAE—BIRCH FAMILY

Monoecious or rarely dioecious trees or shrubs; leaves alternate, simple, deciduous, straight-veined; stipules deciduous; the sterile flowers in catkins, the fertile clustered, spiked or in scaly catkins; the staminate flowers 1-3 together in the axil of each bract, consisting of a membranous 2-4 parted perianth, or naked, 2-10 stamens, with distinct filaments, anthers 2-celled; pistillate flowers with or without a calyx attached to the 2-celled ovary; style 2-cleft or divided; fruit a one-seeded nut or nutlet, subglobose or ovoid, more or less flattened, and frequently with a membranous wing.

The following genera are represented by shrubs growing in Michigan.

1. Pistillate flowers with a calyx, clustered, not in catkins; nut not winged....*Corylus*, p. 73
1. Pistillate flowers without a calyx, in catkins; nut winged
 2. Stamens 2; fertile scales thin, 3-lobed, deciduous with or soon after the nuts.....*Betula*, p. 75
 2. Stamens 4; fertile scales thick, becoming woody, long persistent.....*Alnus*, p. 77

Corylus [Tourn.] L.—HAZELNUTS, FILBERTS

Twigs and petioles, glandular-bristly; involucre consisting of 2

broad fringed bracts.....*C. americana*, p. 73

Twigs and petioles not glandular-bristly; involucre of united bracts,

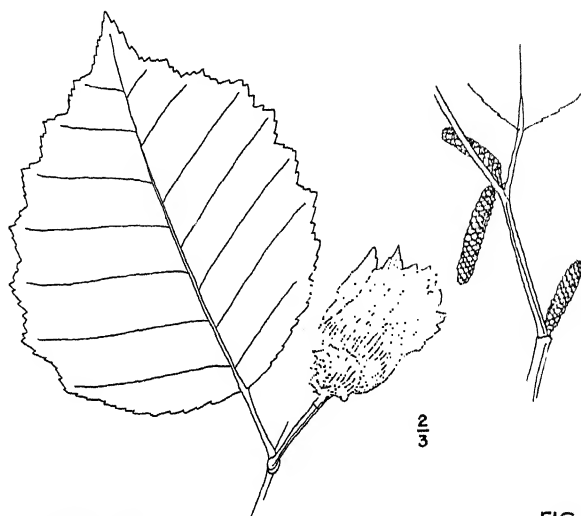
prolonged into a tubular beak.....*C. rostrata*, p. 75

Corylus americana Walt. (American Hazelnut). Fig. 23. Shrubs 1-2.5 m. high, bark gray and smooth; branchlets and petioles more or less densely glandular-bristly; leaves alternate, simple, deciduous, 6-16 cm. long, 4-12 cm. wide, roundish heart-shaped, serrate all around, nearly glabrous above, finely tomentose especially along the veins beneath; petioles 3-24 mm. long, pubescent and glandular; staminate catkins 4-8 cm. long in very early spring; pistillate flowers in bud-like clusters, inconspicuous; involucre of the nut consisting of two enlarged bracts, open above down to the nut which is exposed at maturity, finely pubescent and glandular with stalked glands; nuts compressed-globose, 1-1.5 cm. long; seed edible. Flowers, March, April; nuts ripe August, September.



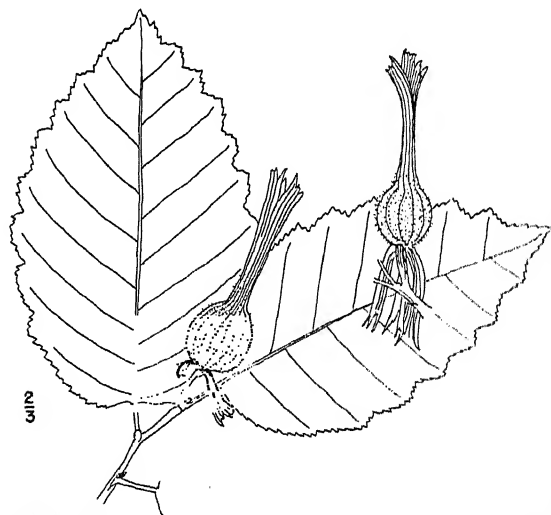
The range of the American Hazelnut is from the New England states to Saskatchewan and southward where it is found in thickets in both dry and moist soil and is very common. Michigan, throughout the Lower Peninsula.

The fruit of the American Hazelnut resembles the filbert of commerce (*C. avellana*) and is regarded as equal to or superior to it. The squirrels and



CORYLUS AMERICANA

FIG. 23

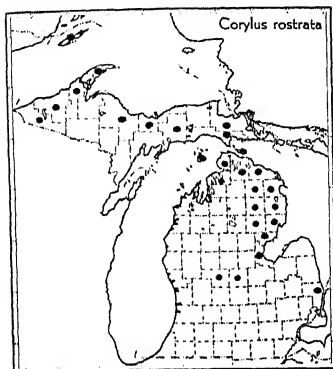


CORYLUS ROSTRATA

FIG. 24

chipmunks are fully aware of this and it is rarely that the nuts are left long enough on the bushes to be gathered by humans.

Corylus rostrata Ait. (Beaked Hazelnut). Fig. 24. Shrubs 2-5 m. high; bark gray; twigs glabrous or sometimes with a few long hairs; leaves simple,



alternate, deciduous, ovate or ovate-oblong, 5-13 cm. long, 3.5-8 cm. wide, cordate or rounded at base, acuminate at the apex, sharply and irregularly serrate, or somewhat lobed, glabrous or with scattered hairs, pubescent on the veins beneath; petioles about 1 cm. long, puberulent; involucre of united bracts, much prolonged above the ovoid nut into a narrow tubular beak, densely bristly; seed edible. Flowers, April, May; fruit ripe August, September.

The Beaked Hazel is distributed from Quebec to British Columbia, south to Delaware, Michigan, Missouri and westward. Michigan, common throughout the northern portion, rare in the southern.

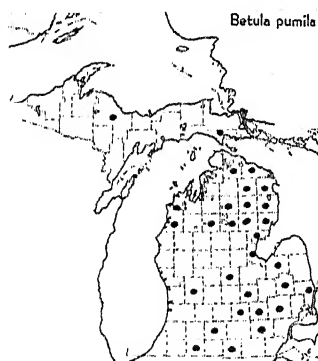
Betula [Tourn.] L.—BIRCHES

Young branchlets pubescent with long soft hairs, not glandular.....*B. pumila*, p. 75

Young branchlets glabrous or minutely puberulent, conspicuously

dotted with resinous wart-like glands.....*B. glandulosa*, p. 77

Betula pumila L. (Low or Swamp Birch). Fig. 25. Stems 0.5-3 m. high; bark dark-gray to reddish-brown with numerous light-colored lenticels; young

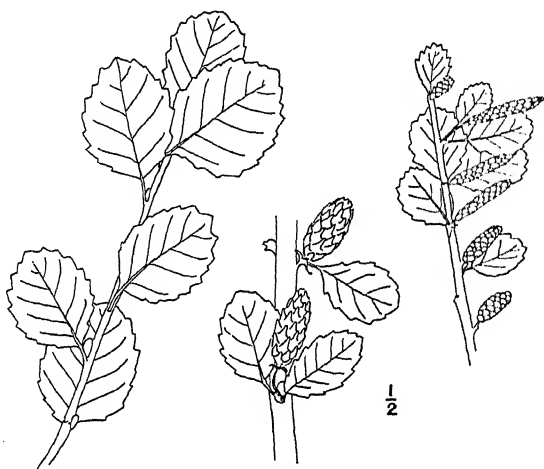


branches soft-downy; leaves alternate, simple, deciduous, obovate, orbicular or reniform, 1-3.5 cm. long, wedge-shaped at base and usually rounded at apex, coarsely serrate, hairy when young, becoming glabrate, veinlets on both sides finely reticulated; fruiting catkins 0.7-3 cm. long, 5-9 mm. thick; bracts variable; wings narrower than or rarely as broad as the body of the fruit, or wanting; nut ovate to obovate. Flowers, May, June; fruit, August, September.

The Swamp Birch is found in bogs from Labrador and Newfoundland to Ontario, northern New Jersey, Ohio, Indiana, Illinois, Minnesota. Michigan, frequent throughout.

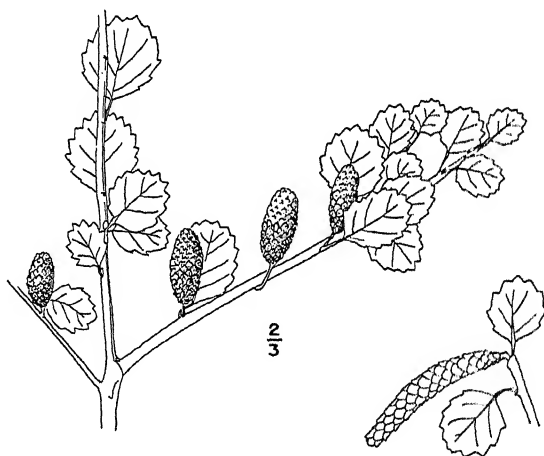
Betula pumila L. var. *glandulifera* Regel.

differs from the typical species in having its young branchlets and leaves resiniferous or glandular-dotted. Otherwise it is the same as the species. Its range is from Ontario and Michigan to Minnesota and Saskatchewan. In Michigan it appears to be more common northward than the species.



BETULA PUMILA

FIG. 25



BETULA GLANDULOSA

FIG. 26

Betula glandulosa Michx. (Dwarf Birch). Fig. 26. Stems erect or depressed, 0.3-1 m. high; twigs brown, glandular-dotted, not pubescent; leaves alternate, simple, deciduous, pinnately veined, 0.5-3 cm. long, wedge-obovate, green and glabrous both sides, irregularly denticulate-serrate, slightly reticulated; staminate catkins solitary, about 1 cm. long; fruiting catkins 0.5-2.5 cm. long, 5-9 mm. thick; nut very small, oblong, generally narrower than the wings. Flowers, June, July; fruit, August, September.



The Dwarf Birch ranges from the Arctic barrens south to the mountains of New Brunswick, Maine and New Hampshire, Lake Superior and Minnesota. Michigan, infrequent Upper and Lower Peninsula.

In alpine habitats the Dwarf Birch grows in a procumbent position, more like a creeping plant, to escape the force of the wind.

Alnus [Tourn.] Hill.—ALDERS

Flowers with the leaves; leaves finely serrate;

fruit with a conspicuous wing.....*A. crispa*, p. 77

Flowers before the leaves; leaves coarsely serrate;

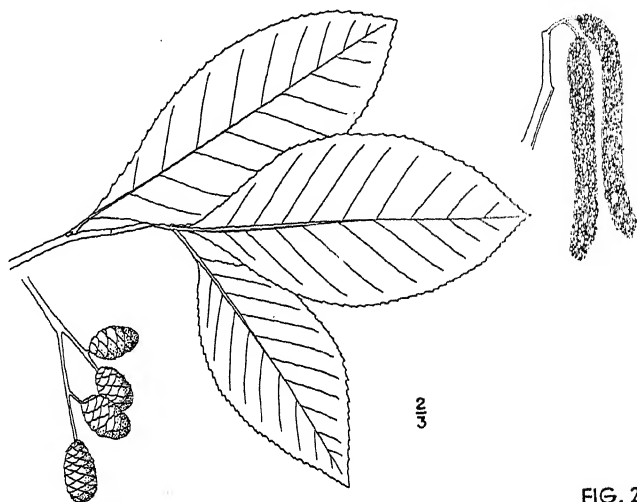
fruit wingless or with a narrow coriaceous margin.....*A. incana*, p. 79

Alnus crispa (Ait.) Pursh. (Green or Mountain Alder). Fig. 27. Shrubs 0.6-3 m. high, bark gray or brownish; young branches and peduncles sparingly puberulent or glabrate; leaves alternate, simple, deciduous, round-oval, ovate or slightly heart-shaped, in maturity 3-6 cm. long, glutinous and smooth, or slightly pubescent on the principal veins beneath, irregularly serrate, the margins often puckered; petioles 8-25 mm. long; staminate catkins 2-3 together, slender 6-10 cm. long, the fertile slender-stalked, loosely racemose, in maturity 1-1.5 cm. long, 7-9 mm. thick, scales firm, woody, persistent, about 4 mm. long, 3-5 lobed; samara 2-2.5 mm. wide, nutlet ovoid. Flowers, June; fruit, August, September.



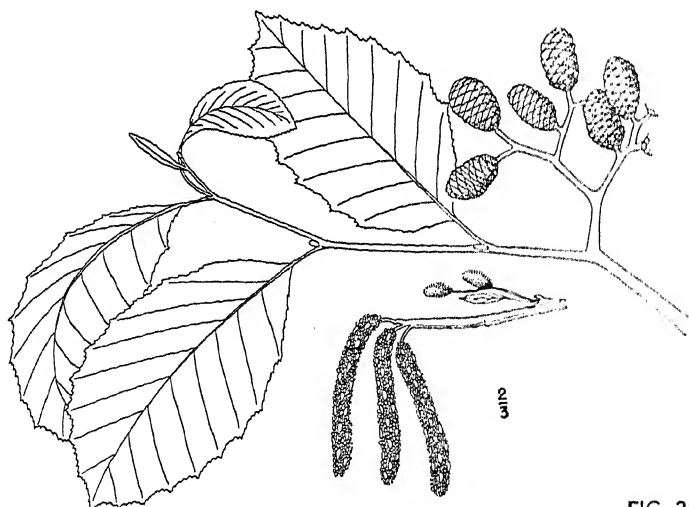
Cool shores and mountains Labrador to New Brunswick, Alaska, south to Massachusetts, New York, Michigan and British Columbia, and in the mountains to Virginia and North Carolina. Michigan, Upper Peninsula.

The alders seem to be exceedingly variable which has led to confusion and overlapping in naming. This species has variously been called in part *Alnus Alnobetula*, *Alnus viridis*, and what is possibly an extreme variation, which has been found in the Upper Peninsula, *Alnus mollis* Fernald.



ALNUS CRISPA

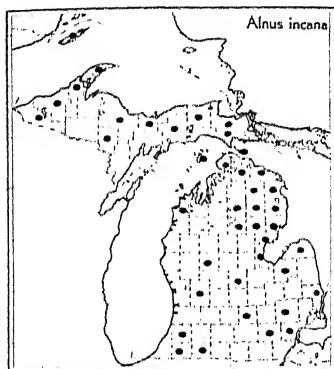
FIG. 27



ALNUS INCANA

FIG. 28

Alnus incana (L.) Moench. (Speckled Alder, Hoary Alder). Fig. 28. A tall shrub, or sometimes a small tree, 2-8 m. high with erect or ascending



stems; bark dark-brown; young twigs reddish-brown all speckled with conspicuous light-gray lenticels; leaves alternate, simple, deciduous, broadly elliptical to ovate, mostly rounded or narrowed at the base, doubly serrate, acute at the apex, 5-9 cm. long, 4-6 cm. wide, upper surface dark-green, pale, sometimes pubescent and often whitish below; midvein and primary veins depressed above, ridged below; petiole 1.5-2 cm. long; staminate catkins 3-4 in a short raceme, 6-10 cm. long, formed during the previous autumn and expanding before the leaves in the early spring, when a cloud of pollen issues from their anthers; the pistillate catkins are also formed during the previous

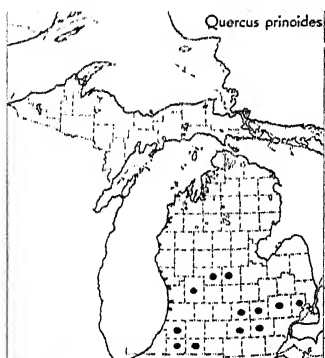
autumn, 3-4 together below the staminate and expand before the leaves, the fruiting 1-1.5 cm. long, 6-10 mm. thick; scales woody and 5-toothed, about 4 mm. long; seed vessel orbicular or ovoid, wingless, 1-celled and 1-seeded. Flowers, March, April, before the leaves; fruit, September, October.

In moist soil from Newfoundland to Saskatchewan, south to New York, Pennsylvania and west to Nebraska. Michigan, common throughout.

The Speckled Alder grows as near the edge of our streams, lakes and ponds as possible and then leans over seemingly to get even nearer to the water. It fringes our northern trout streams, providing shade and protection for the fish and hurdles for the fishermen. The common name of this alder is derived from the lenticels, or spongy places, which are scattered over the external surface of the bark and serve to admit air to the interior of the stem.

FAGACEAE—BEECH FAMILY

Trees or shrubs; leaves alternate, simple, deciduous, straight-veined; stipules

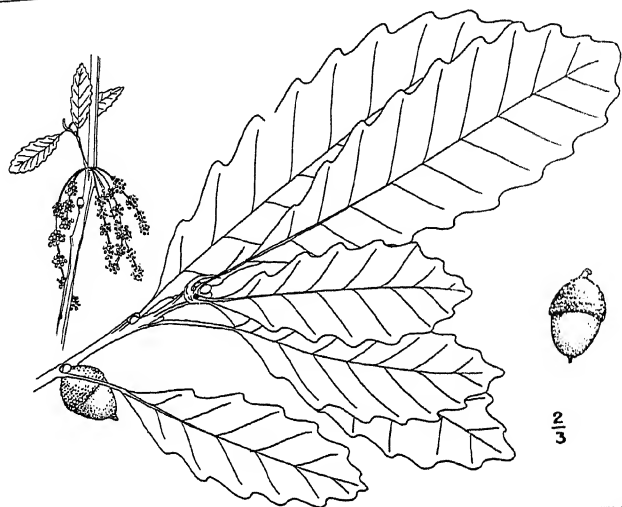


deciduous; flowers monoecious, the sterile, pendulous or erect catkins, the fertile, solitary or several together; nut 1-celled and 1-seeded, fully or partly inclosed in a cup consisting of an involucre of united bracts; ovary 3-7 celled, with 1-2 ovules in each cell; styles 3.

Only one shrub in this family, one of the oaks (genus *Quercus*), occurs in Michigan.

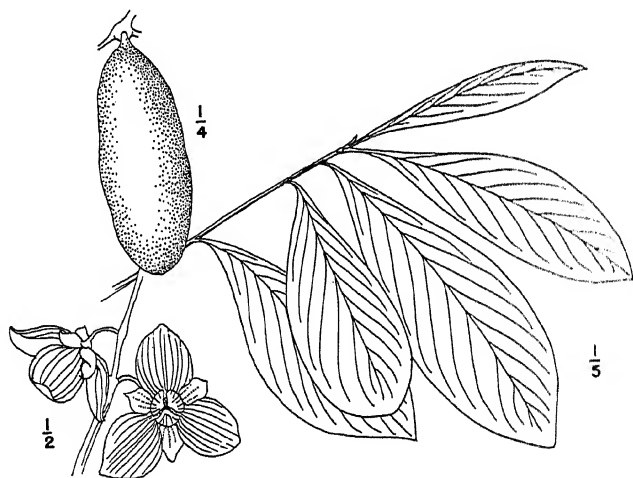
Quercus [Tourn.] L.—OAKS

Quercus prinoides Willd. (Scrub Oak, Dwarf Chestnut Oak). Fig. 29. Shrub or a very small tree; bark pale, often scaly; leaves



QUERCUS PRINOIDES

FIG. 29



ASIMINA TRILOBA

FIG. 30

alternate, simple, deciduous, oblanceolate, usually acute or pointed, 6-13 cm. long, 2-5 cm. broad, base wedge-shaped, undulate-toothed, upper side light green and glossy, a few scattered hairs, lower side pale, densely hairy; petioles 0.5-1.5 cm. long; staminate catkins about 4 cm. long; pistillate flowers sessile or short-stalked; acorns globose or obovoid, 1.5-2 cm. long, 1-1.5 cm. broad, light brown; cups pubescent, covering about one-third of the acorn. Flowers, April, May; fruit ripe September, October.

Dry soil New Hampshire to Minnesota, southward to North Carolina and Texas. Michigan, infrequent lower portion of southern peninsula.

We are so accustomed to think of the oaks only as large trees that it is rather a novelty to find acorns growing on bushy shrubs.

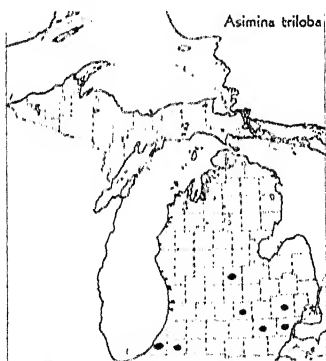
ANONACEAE—CUSTARD APPLE FAMILY

Trees or shrubs; leaves deciduous, alternate, entire and feather-veined; stipules none; flowers axillary, nodding; calyx of 3 sepals; petals mostly 6, arranged in 2 series; stamens many; filaments very short; pistils many, separate or coherent; fruit large and fleshy; seeds large.

About 46 genera and 550 species, mostly in the tropics. Only the following in Michigan.

Asimina Adans.—NORTH AMERICAN PAPAWS

Asimina triloba Dunal. (Common Papaw). Fig. 30. Shrub or small tree, 1-12 m. high; bark smooth, or ridged on the older plants; twigs reddish-brown,



pubescent, becoming glabrous; leaves deciduous, alternate, entire, thin, obovate, wedge-shaped at base, acute, 1.5-3 dm. long; petioles 8-12 mm. long; flowers dark-purple, axillary, appearing with the leaves on shoots of the preceding season, 2-4 cm. in diameter; sepals 3, ovate, 8-12 mm. long, densely dark-pubescent; petals 6, the outer spreading, nearly round, somewhat longer than the ovate inner ones; stamens many, very short; fruit a fleshy berry, pendulous with several on a thick peduncle, 7-13 cm. long, 2-7 cm. thick, green, turning dark-brown when ripe, the pulp sweet and edible. Flowers, March, April; fruit ripe in October.

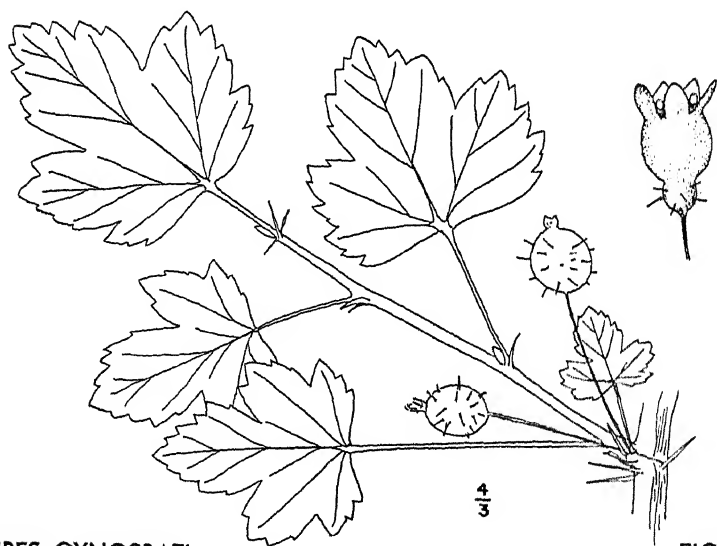
Banks of streams in rich soil Ontario, New York, New Jersey to Michigan, Nebraska, Florida and Texas. Michigan, confined to about the southern one-third of the Lower Peninsula.

The papaw has interesting foliage and is desirable for ornamental planting. I have tried many times to establish it, but found it difficult to transplant, perhaps because the attempt was made near the northern limits of its range.



BENZOIN AESTIVALE

FIG. 31



RIBES CYNOSBATI

FIG. 32

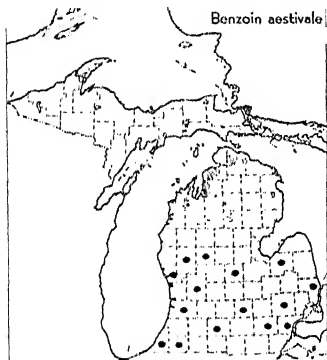
LAURACEAE—LAUREL FAMILY

Aromatic trees or shrubs; leaves alternate, simple, deciduous, mostly with minute pellucid dots; flowers regular; calyx of 4-6 colored sepals, imbricated in two rows in the bud, free from the ovary, which is 1-celled and 1-ovuled; style single; fruit a 1-seeded drupe.

The genus *Benzoin* is the only one in this family in Michigan having plants classed as shrubs. The Sassafras is a member of the Laurel family but it is rated as a tree and therefore not included.

Benzoin Fabric.—SPICE BUSH

Benzoin aestivale (L.) Nees. (Spice Bush). Fig. 31. Aromatic shrubs 1-3 m. in height, well-shaped; branchlets at first green, smooth, later olive-green, at times gray, finally grayish-brown, roughened; leaves alternate, simple, deciduous, oblong-ovate to oval, 4-15 cm. long, 2-6.5 cm. wide, acute or short-acuminate at the apex, or the lower leaves blunt or rounded, nearly smooth, pale underneath, margin entire; petioles 0.5-2 cm. long, or shorter on the lower leaves; the honey-yellow flowers appearing before the leaves in small sessile clusters or umbels of 4-6, surrounded by an involucre of 4 deciduous scales; fruit a fleshy, obovoid drupe, bright red, about 1 cm. long. Flowers, March, April; fruit ripe August, September.



The range of the Spice Bush is from Maine to Michigan, eastern Kansas and southward to Georgia and Mississippi. Michigan, frequent central and southern portions.

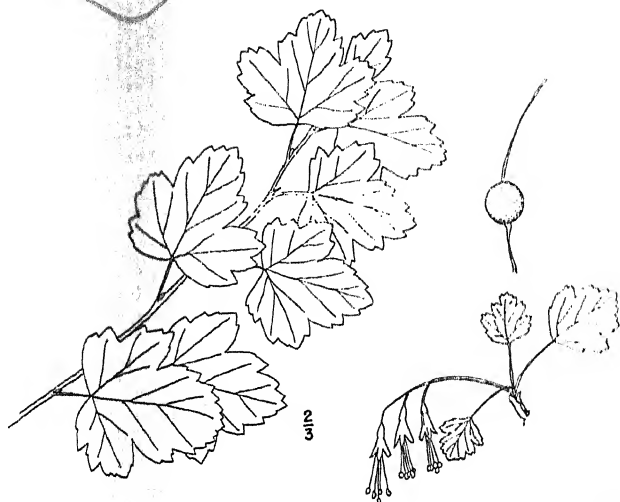
Although generally found in damp rich woods it is easily transplanted and is worthy of a place in any cultivated border. The bush is aromatic in bark, fruit and leaf, and it is from this quality that it derives its generic name, *Benzoin*, the name of an Oriental gum. A concoction made from the bark has been used in intermittent fevers, and the berries are said to have been sometimes used in place of allspice.

The shrub is well supplied with common names: Wild Allspice, Fever Bush, Benjamin Bush, Snap-wood.

SAXIFRAGACEAE—SAXIFRAGE FAMILY

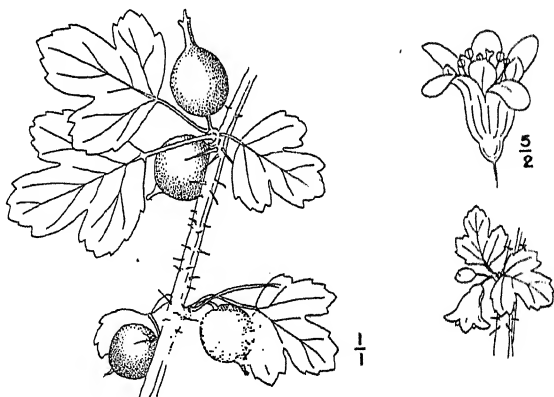
Shrubs or herbs; leaves deciduous, alternate or rarely opposite; true stipules, none, but often with stipule-like sheaths; flowers mostly perfect and regular; inflorescence of several kinds, or the flowers solitary; calyx either free or adherent, mostly persistent, or withering; petals 4-5, rarely wanting; stamens 4-10, or numerous; ovary 1-2 celled, rarely more; seeds small, numerous.

Of the Saxifrage Family only one genus with shrubby plants is found in Michigan.



RIBES GRACILE

FIG. 33



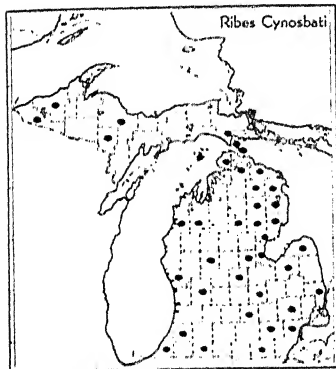
RIBES OXYACANTHOIDES

FIG. 34

Ribes L.—CURRANTS, GOOSEBERRIES

- 1. Peduncles 1-4 flowered; stems more or less prickly.....*R. Cynosbati*, p. 85
- 2. Ovary bristly, fruit prickly.....*R. Cynosbati*, p. 85
- 2. Ovary glabrous
 - 3. Flowers white; filaments long.....*R. gracile*, p. 85
 - 3. Flowers greenish or purplish, filaments shorter.....*R. oxycanthoides*, p. 87
- 1. Flowers several in elongated racemes
 - 4. Leaves with resinous atoms beneath; calyx campanulate; fruit black, bracts longer than the pedicels.....*R. floridum*, p. 87
 - 4. Leaves without resinous atoms
 - 5. Stems densely covered with prickles; fruit black.....*R. lacustre*, p. 89
 - 5. Stems without prickles; fruit red
 - 6. Ovary and berries glandular-bristly.....*R. prostratum*, p. 89
 - 6. Ovary and berries smooth; calyx purplish; decumbent shrub.....*R. triste*, p. 90

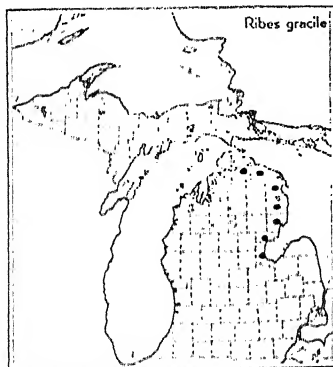
Ribes Cynosbati L. (Prickly Gooseberry, Dogberry). Fig. 32. Shrub, 0.5-1.5 m. high, erect or spreading; nodal spines slender, solitary or sometimes 2-3



together, 0.5 cm. long; leaves alternate, simple, deciduous, thin, round-ovate, rounded or subcordate at base, soft pubescent both sides, 3-5 cm. long, 3.5-5.5 cm. wide, 3-5 lobed, irregularly and finely dentate; petioles slender, generally pubescent; peduncles and pedicels slender, pubescent; flowers, 1-3, greenish-white, campanulate to urn-shaped; calyx-lobes oblong, shorter than the ovoid tube; petals shorter than the sepals; stamens and undivided style not exerted; berry armed with long prickles, 8-15 mm. in diameter, reddish-purple when ripe. Flowers, April, June; fruit ripe July, August.

Rocky woods, thickets and hillsides western Maine to the mountains of North Carolina, west to Manitoba and Missouri. Michigan, common throughout.

This is our commonest wild gooseberry. The berries when ripe are sweet and pleasant, but the spines are very sharp and uncomfortable to handle. It is a common undershrub in our upland woods.

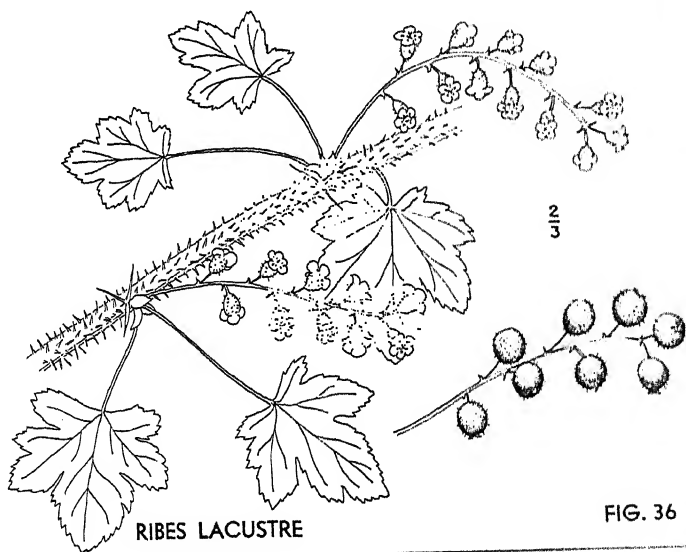


Ribes gracile Michx. (Missouri Gooseberry). Fig. 33. Erect shrub, 1-1.5 m. high; young twigs greenish-yellow; nodal spines 1-3, 7-17 mm. long, stout and red; leaves slender-petioled, alternate, simple, deciduous, somewhat pubescent when young, nearly orbicular in outline, 2-4 cm. long and wide, 3-5 rather blunt-lobed, dentate, truncate, slightly cordate, or sometimes obtuse at base; peduncles long and slender, more or less pubescent, 1-3 flowered; flowers white or



RIBES FLORIDUM

FIG. 35



RIBES LACUSTRE

FIG. 36

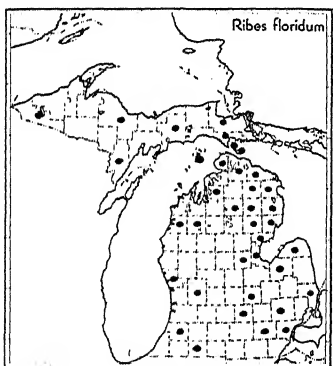
whitish, drooping, pedicels about 1 cm. long in fruit; bractlets 2 mm. long, glandular; calyx-tube narrow, shorter than the linear lobes; petals small, spatulate, erect; filaments capillary, 1-1.5 cm. long, connivent or parallel, conspicuously exserted; berry smooth, globose, 8-15 mm. in diameter, dark-purple when ripe. Flowers, May; fruit, July, August.



In dry or rocky soil Connecticut to South Dakota and southward. Michigan, recorded from upper counties of the Lower Peninsula only.

This species appears to be much less common than the preceding which may be occasioned by the confusion of names. The following are synonyms: *Ribes missouriensis* Nutt.; *Grossularia missouriensis* Cov. and Brett.

nodal spines 1-3, light-colored; leaves alternate, simple, deciduous, suborbicular, 2-4 cm. long and about as wide, the lobes acute or obtuse, irregularly crenate-dentate, commonly pubescent above and beneath; petioles generally shorter than the blades, pubescent; peduncles very short, 1-2 flowered; flowers small, perfect, greenish-white to dull purplish; calyx-lobes mostly glabrous, oblong or obovate, recurved when mature; petals 5, broadly ovate or spatulate, alternate with the sepals; stamens 5, short, not exserted; pistil slightly longer than the stamens; berry globose, smooth, about 1 cm. in diameter, reddish-purple when ripe. Flowers, May, July; fruit ripe July, August.

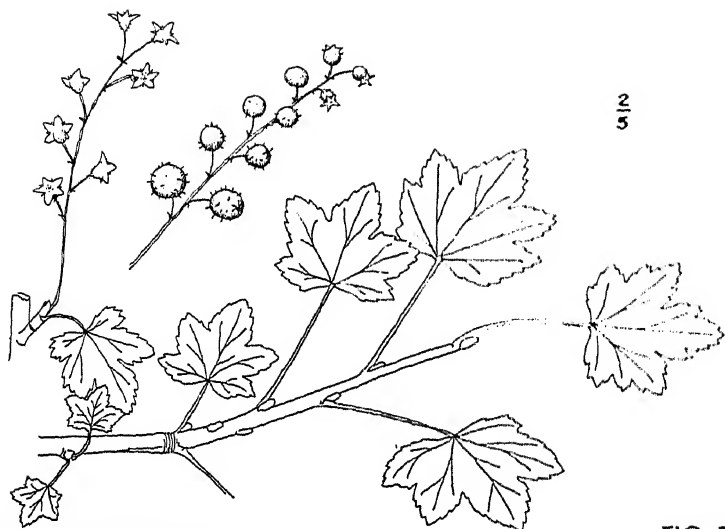


In woods and low grounds Newfoundland to Hudson Bay, British Columbia, Michigan, North Dakota and Montana. Michigan, both Upper and Lower Peninsulas.

This is the common smooth-fruited gooseberry of the north. Its fruit is edible and has a very agreeable flavor. The following varieties, both found in Michigan, have been separated and named: *Ribes oxycanthoides* L. var. *calicicola* Fernald, with densely soft-pubescent leaves and pubescent calyx, and

Ribes oxycanthoides L. var. *saxosum* (Hook.) Coville, with the calyx and subcordate leaves essentially glabrous.

Ribes floridum L'Her. (Wild Black Currant). Fig. 35. Shrub with erect, unarmed branches; bark becoming dark-brown; leaves alternate, simple, deciduous, thin, nearly orbicular in outline, glabrous above, more or less pubescent and resinous-dotted beneath, 4-7 cm. in length and width, cordate or truncate



RIBES PROSTRATUM

FIG. 37



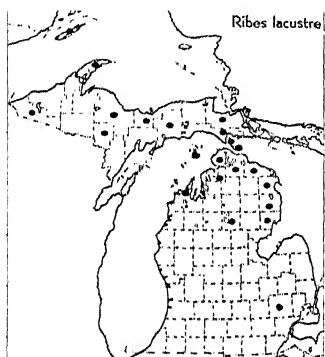
RIBES TRISTE

FIG. 38

at base, sharply 3-5 lobed, doubly serrate; petioles pubescent, 2-4 cm. long; racemes drooping, downy, 5-16 flowered; bracts linear-lanceolate, longer than the pedicels, persistent; flowers 8-10 mm. in diameter, yellow and whitish; calyx tubular bell-shaped, smooth, its lobes short, broad, obtuse; petals oblong, erect more than half as long as the sepals; stamens not exerted; styles 6-7 mm. long, united nearly to the summit; berry black, 6-10 mm. in diameter, smooth, edible. Flowers, April, May; fruit ripe July, August.

The Wild Black Currant ranges from Nova Scotia to Manitoba, southward to Kentucky, Iowa and Nebraska. Michigan, common throughout.

This species resembles the black currant of the garden, but is rarely cultivated.

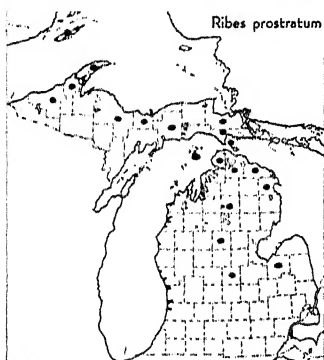


The foliage is luxuriant and it forms a graceful spreading bush, attractive both in flower and fruit.

Ribes lacustre (Pers.) Poir. (Swamp Black Currant). Fig. 36. Low shrub; young stems clothed with bristly prickles and with weak thorns; leaves simple, alternate, deciduous, nearly orbicular, thin, glabrous or nearly so, deeply 5-7 lobed, 2.5-7 cm. long and about the same width, the lobes obtuse or acutish, incised-dentate, cordate at base; petioles slender, more or less pubescent; racemes loosely spreading or drooping, 2-5 cm. long, comparatively few-flowered, the peduncle and pedicels puberulent and glandular-bristly;

flowers greenish or purplish, 7-8 mm. in diameter; calyx-tube short, sepals blunt, longer than the petals; stamens very short, not exerted; styles short, partly united; berry bristly, purplish-black, about 6-10 mm. in diameter. Flowers, May, June; fruit, July, August.

Cold woods and swamps Newfoundland to British Columbia, south to northern New England, Michigan, Minnesota, Colorado and northern California and in the mountains to Pennsylvania. Michigan, upper part of Lower Peninsula and Upper Peninsula; also recorded from Oakland County.



The fruit of the Swamp Black Currant is unpleasant to the taste.

Ribes prostratum L'Her. (Skunk Currant). Fig. 37. Low shrub with reclining and spreading branches, thornless and without prickles; bark blackish on older branches; leaves simple, alternate, deciduous, thin, deeply heart-shaped, 5-7 lobed, smooth or somewhat pubescent on the veins beneath, the lobes ovate, acute, doubly serrate, 3.5-6 cm. long, 5-8 cm. wide; petioles about as long as the blades; racemes erect or ascending, 3-6 cm. long, loosely several-flowered, peduncles and pedicels puberulent, bracts

glandular, shorter than the pedicels; flowers yellowish or purplish, about 4 mm. broad; calyx broadly campanulate, its lobes short and broad; stamens 5, short, not exserted; style 2-cleft; berry red, glandular-bristly, 6-7 mm. in diameter, disagreeable flavor. Flowers, May, June; fruit, July, August.

In cold wet places Newfoundland to Athabasca, British Columbia, south to northern New England, Michigan, Minnesota and along the mountains to North Carolina. Michigan, upper part of Lower Peninsula and the Upper Peninsula.

Both plant and fruit emit a disagreeable odor when bruised, hence its common name Skunk Currant. Its habitat is the cold, damp woods and it does not take kindly to cultivation or the warmth of sunshine.

Ribes triste Pall. (Swamp Red Currant. Fig. 38. Low, straggling or reclining shrub, the branches often rooting freely, unarmed, the bark becoming grayish-black; leaves simple, alternate, deciduous, glabrous above, pale and more or less pubescent beneath, somewhat heart-shaped, the sides nearly parallel, 5-10 cm. long and broad, the lobes mostly broad-deltoid, doubly crenate-serrate; petioles more or less pubescent and generally shorter than the blades; racemes borne on the old wood and mostly below the tufted leaves, several-flowered, drooping, 3-9 cm. long; peduncles and pedicels puberulent and glandular, pedicels longer than the ovate bractlets; flowers 4-5 mm. in diameter, purplish; calyx saucer-shaped, its segments broadly cuneate, very obtuse; petals shorter than the sepals, broadly cuneate; styles deeply cleft; anther-sacs contiguous, nearly parallel; ovary glabrous; berry bright red, glabrous, 4-7 mm. in diameter, hard and acid. Flowers, June, July; fruit ripe August, September.



Cold woods and bogs Newfoundland to Alaska, New Jersey, Michigan, South Dakota and Oregon. Michigan, well distributed both peninsulas.

This species has a variety *albinervium* (Michx.) Fernald with the leaves glabrous or glabrate beneath which has the same range and appears to be more common.

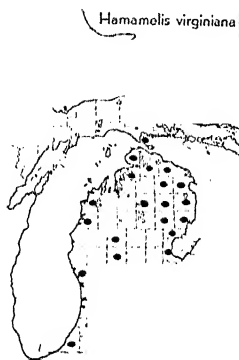
HAMAMELIDACEAE—WITCH-HAZEL FAMILY

Shrubs or trees; leaves alternate, simple, deciduous; stipules deciduous; flowers in heads or spikes, often polygamous or monoecious; calyx adhering to the base of the ovary, which consists of two pistils united below, forming a 2-beaked and 2-celled woody capsule, opening at the summit, with one or more bony seeds in each cell; petals four to many or none, long and narrow; stamens twice as many as the petals.

Only the following genus occurs in Michigan.

Hamamelis L.—WITCH-HAZELS

Hamamelis virginiana L. (Common Witch-hazel). Fig. 39. Tall shrub with smooth bark, becoming broken on old specimens; twigs with a more or



less rusty pubescence; leaves simple, alternate, deciduous, short-petioled, obovate or oval, 6-15 cm. long, 4-10 cm. wide, wavy-toothed, with stellate pubescence when young; flowers in small axillary clusters appearing in the early autumn when the leaves are falling and while the fruit of the previous year remains; calyx 4-parted, persistent, adnate to the base of the ovary; petals 4, narrow, strap-shaped, crinkly, bright yellow; fruit a woody 2-celled capsule, opening by 2 valves at the top of each cell containing 1 black, oblong, bony seed. Flowers, October; fruit mature following summer.

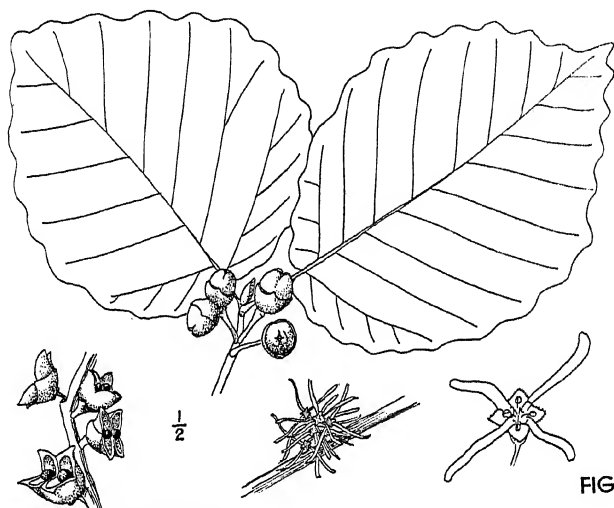
The Common Witch-hazel is found from Nova Scotia to Minnesota, south to Florida and Texas. Michigan, common throughout.

The late flowering of this shrub puts it in a class by itself. In appearance it is no more beautiful than many of our spring flowering shrubs, but coming into bloom as its leaves are falling in autumn it attracts more than ordinary attention and its fame has been sung in prose and poetry. It is quite widely distributed throughout the state and may be looked for on the sides of ravines and at the edges of damp woodlands. The leaves, bark and twigs enter into the preparation of fluid extracts, liniments and salves and the branches are said to have been used as divining rods to locate underground water when a well was to be dug.

ROSACEAE—ROSE FAMILY

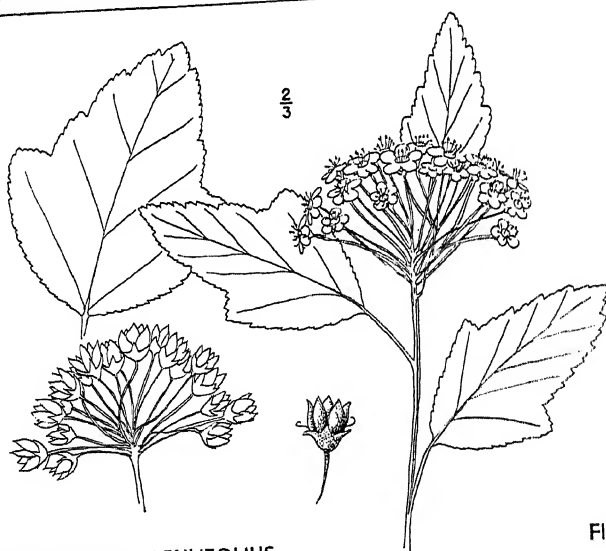
Trees, shrubs, or herbs; branches unarmed, prickly or thorny; leaves deciduous, alternate, simple or compound, mostly with stipules which sometimes fall off early; flowers regular, perfect or polygamo-dioecious; calyx free from or attached to the ovary, generally 5-lobed; petals the same number as the sepals, or rarely lacking; stamens generally numerous, distinct, inserted on the calyx; anthers small; pistils 1-many, distinct, or united with the calyx; ovary 1-celled or sometimes imperfectly 2-celled; style terminal or lateral; fruit various, follicles, achenes, pomes, drupes, hips, and a number of drupelets.

The Rose family is of wide distribution. Botanists differ greatly in their conception of the genera and species to be included within its limits. Some split it into a number of families, others consider the divisions as sub-families. Using the broader interpretation the family embraces about 90 genera and some 2000 species. As here treated the Rose Family embraces some of the most important of our ornamental and economic herbaceous plants, shrubs and trees. Under the heading of ornamentals may be listed the following: rose, spiraea, nine-bark, flowering almond, hawthorn, pearl bush, shad-bush, cotoneaster, shrubby cinquefoil, Japanese quince, and many others both shrubby and herbaceous.



HAMAMELIS VIRGINIANA

FIG. 39



PHYSOCARPUS OPULIFOLIUS

FIG. 40

Under the heading of economic species may be listed such important items as apples, plums, cherries, raspberries, blackberries, strawberries, etc.

The following genera with shrubby plants are found in Michigan.

1. Leaves simple, flowers white or pinkish, cymose or racemose
 2. Spineless shrubs
 3. Fruit a dry follicle
 4. Follicles inflated, opening both sides; seeds shining.....*Physocarpus*, p. 93
 4. Follicles not inflated, opening on one side only; seeds dull.....*Spiraea*, p. 95
 3. Fruit a fleshy pome
 5. Fruit with several seeds
 6. Midrib of leaves glandular; flowers in corymbed or umbel-like cymes.....*Pyrus*, p. 97
 6. Midrib of leaves not glandular; flowers in racemes.....*Amelanchier*, p. 99
 5. Fruit with one large, bony seed.....*Prunus*, p. 129
 2. Shrubs with large spines; leaves lobed and doubly serrate.....*Crataegus*, p. 102
 1. Leaves compound
 7. Flowers yellow; fruit a dry achene; spineless shrubs.....*Potentilla*, p. 109
 7. Flowers white or pink; spiny or prickly shrubs
 8. Fruit of many achenes collected on a receptacle, becoming small drupes.....*Rubus*, p. 111
 8. Fruit a globose or urn-shaped fleshy hip enclosing the bony achenes.....*Rosa*, p. 119

Physocarpus Maxim.—NINE-BARKS

About five species and several varieties comprise this genus, one of which occurs in Michigan.

Physocarpus opulifolius (L.) Maxim. (Common Nine-Bark). Fig. 40. Shrub 1-3 m. high, spreading with many branches; old bark loose and separating in numerous layers; twigs more or less



pubescent; stipules falling early; leaves deciduous, alternate, simple, ovate-orbicular, somewhat 3-lobed, 3-7 cm. long, wedge-shaped or heart-shaped at the base, mostly acute at the apex, crenate-dentate, dark-green above, pale beneath, glabrous above, somewhat pubescent beneath in the axils of the nerves; petioles slender, 1-2 cm. long; flowers white, numerous in umbel-like terminal corymbs, about 1 cm. broad; peduncle and pedicels more or less pubescent; calyx 5-lobed, bell-shaped, pubescent; petals 5, rounded, inserted on the throat of the calyx; stamens 30-40, inserted with the petals; filaments white; pistils 5, short-stalked, alternate with the calyx-

lobes; stigma terminal, capitate; pods 1-5, inflated, acute, with an oblique awl-shaped tip, glabrous or somewhat pubescent, very conspicuous when ripe; seeds 2-4 in each pod, ovoid or globose, shining, light brown. Flowers, June; fruit, August, September.

River banks and rocky places Quebec to Georgia, west to Manitoba and Kansas. Michigan, throughout.



SPIRAEA SALICIFOLIA FIG. 41



SPIRAEA TOMENTOSA FIG. 42

The Common Nine-Bark is very generally planted in shrubby borders and is a most satisfactory plant in cultivation. It is attractive both in flower and fruit. Its common name is derived from the numerous exfoliating strips of bark on the older branches. Var. *intermedius* (Rydb.) Robinson with the pods permanently pubescent has been separated. Its range includes Michigan and it should be looked for with the species.

Spiraea [Tourn.] L.—SPIRAEAS, MEADOW-SWEET

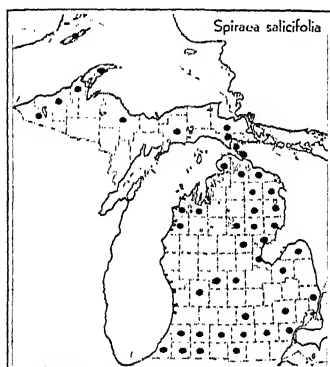
A genus of about 60 species, only two of which are native to Michigan.

Flowers white; leaves smooth; inflorescence tomentulose.....*S. salicifolia*

Flowers rose color; leaves green above, densely tomentose

and white or tawny beneath.....*S. tomentosa*

Spiraea salicifolia L. (Meadow-sweet). Fig. 41. An erect shrub, 3-12 dm. high, simple or branched; stems brownish-yellow, more or less pubescent; leaves

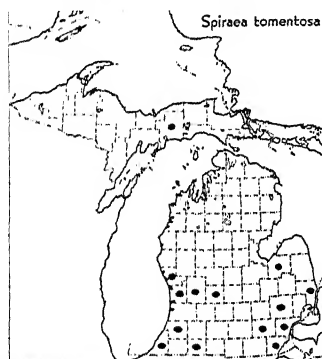


deciduous, alternate, simple, lance-oblong, obovate or oblanceolate, 5-7 cm. long, 1-2 cm. wide, acute at the apex, wedge-shaped at the base, sharply fine-serrate, glabrous, or sparingly pubescent both sides; petioles short; inflorescence, a dense terminal panicle with axis, peduncles and pedicels tomentulose; flowers white, perfect, 6-8 mm. in diameter; calyx short-campanulate, 5-lobed, persistent; petals 5, suborbicular, short-clawed, inserted on the calyx; stamens numerous, exserted; filaments thread-like; stigma capitate; follicles usually 5, not inflated, few to several-seeded; seeds about 2 mm. long. Flowers, July, August; fruit, September.

Found chiefly in low ground from New York and Ontario to Saskatchewan, south to North Carolina, Missouri and Mississippi. Michigan, throughout.

The Meadow-sweet is a common habitant of our low, open ground and swamps. Several varieties of it are in cultivation. It is also known as Queen-of-the-Meadow, Quaker Lady, and Willowleaf

Spiraea.



Spiraea tomentosa L. (Hardhack, Steeple Bush). Fig. 42. Erect shrub about 1 m. high; stems usually simple; twigs covered with a floccose pubescence; leaves deciduous, alternate, simple, ovate to oblong or ovate-lanceolate, 3-7 cm. long, 1-3 cm. wide, rounded or wedge-shaped at the base, acute or blunt at the apex, margin unequally serrate, dark-green above, covered with brown tomentum beneath when full grown; petioles



FIG. 43

PYRUS ARBUTIFOLIA VAR. *ATROPURPUREA*

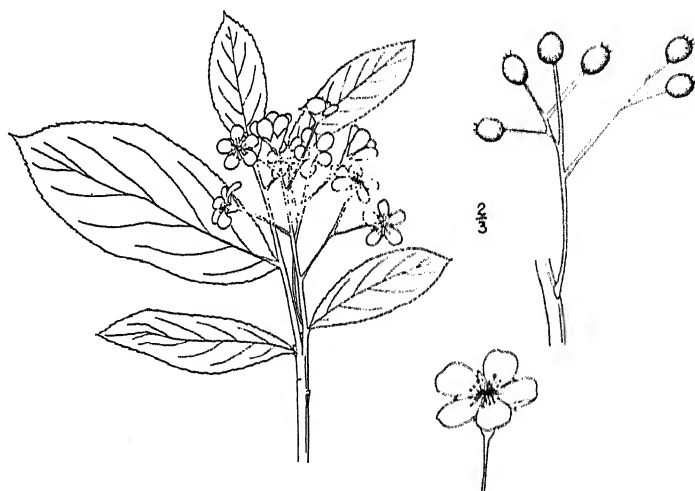


FIG. 44

PYRUS MELANOCARPA

short; inflorescence of short racemes crowded in a dense terminal panicle, tomentose; flowers rose or pale purple, very rarely white, about 4 mm. across; calyx tomentose, campanulate, 5-lobed, the lobes triangular, reflexed; petals 5, short-clawed, obovate, about 1.5 mm. long; stamens numerous, exserted; filaments threadlike; stigma capitate; pods 5, about 2.5 mm. long, tomentose becoming glabrate; seeds 1.5 mm. long. Flowers, July to September; fruit, September, October.

Low grounds Nova Scotia to Manitoba, south to Georgia, west to Kansas. Michigan, infrequent throughout.

The Steeple Bush no doubt received its common name from the shape of the panicle which is terminal and pointed. One does not have to stretch the imagination much to see in it a marked resemblance to a steeple. The panicle begins flowering at the summit. When the upper flowers are open the lower are only in the bud. This spiraea is a desirable shrub for ornamental planting because of its late flowering period.

Pyrus [Tourn.] L.—CHOKEBERRIES, PEARS, etc.

According to the manual which is being followed this genus is divided into four subdivisions, as follows; *Pirophorum* Focke (pears), *Malus* (Hill) S. F. Gray (apples), *Adenorhachis* DC. (chokeberries) and *Sorbus* (L.) S. F. Gray (mountain ashes). Only the third division, the chokeberries, includes shrubs native to Michigan.

Pedicels and calyx canescent-tomentose.....*P. arbutifolia* var. *atropurpurea*, p. 97
 Pedicels and calyx nearly or quite smooth.....*P. melanocarpa*, p. 99

Pyrus arbutifolia (L.) L. f. var. *atropurpurea* (Britton) Robinson. (Red or Purple Chokeberry). Fig. 43. Shrub 1-2.5 m. high; bark smooth or more or less roughened; twigs tomentose when young, becoming glabrous, reddish-brown to gray; leaves deciduous, alternate, simple, oblong-ob lanceolate, or oval, 4-8 cm. long, 1.5-4 cm. wide, rounded or wedge-shaped at base, acute or abruptly short-acuminate at the apex, finely glandular-serrate, green and glabrous or glabrate above, paler and permanently canescent-tomentose below; petioles 2-10 mm. long; flowers borne in terminal compound, pubescent cymes, perfect, white or purplish, 8-12 mm. in diameter; calyx urn-shaped, 5-lobed, tomentose, attached to the ovary; petals 5, spreading, obovate, 5-8 mm. long; stamens numerous; styles 3-5, united at base; pome globose or somewhat depressed, 8-10 mm. in diameter, claret-colored to purplish. Flowers, May, June; fruit, September, October, remaining on the bush until early winter.

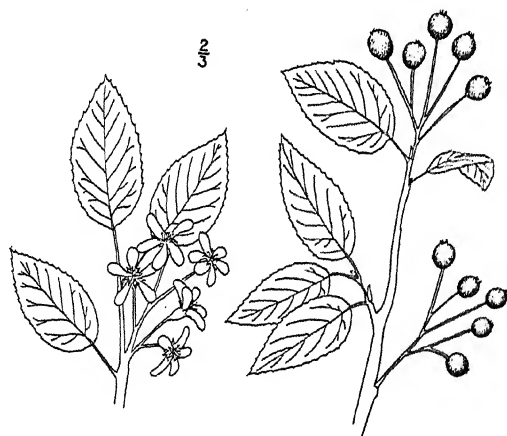


Swamps and low woods New York to Ontario, south to Florida and Arkansas. Michigan, throughout.



AMELANCHIER OBLONGIFOLIA

FIG. 45

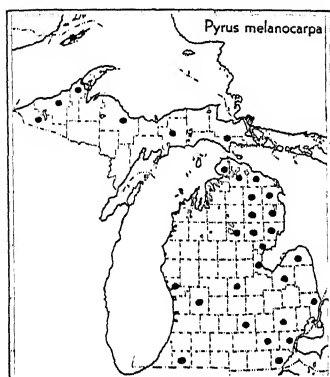


AMELANCHIER SPICATA

FIG. 46

The Chokeberries make desirable cultivated shrubs. Their foliage is attractive as well as their flowers and fruit. The leaves turn red in the autumn.

Pyrus melanocarpa (Michx.) Willd. (Black Chokeberry). Fig. 44. Shrub 1-2 m. high; bark grayish-brown, smooth; leaves deciduous, simple, alternate,



obovate, oblanceolate or oval, acute or scarcely pointed at the apex, narrowed at the base, glabrous, or soon glabrate on both sides, 2-8 cm. long, 1-2.5 cm. wide, dark-green above, paler beneath, crenulate, the teeth incurved; petiole 2-5 mm. long; flowers white, 8-12 mm. in diameter, borne in compound cymes of which the peduncle and pedicels are nearly or quite smooth; calyx urn-shaped, glabrous, 5-lobed, the lobes triangular or ovate; petals rounded or ovate, 4-5 mm. long; stamens numerous; styles 3-5 united at the base; pome globose, 6-8 mm. in diameter, nearly black. Flowers, June; fruit, September, October.

In swamps and low grounds, or at times in dryer situations Nova Scotia to western Ontario and Minnesota, south to Florida. Michigan, throughout.

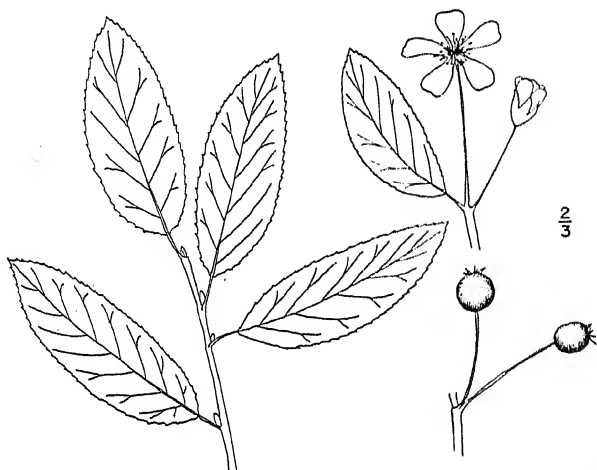
While this has been treated as a separate species some regard it as only a variety. Individual plants occur which cannot be assigned to either the foregoing species or to this one, indicating that if a complete series could be assembled it would be found that they fully intergrade.

Amelanchier Medic.—JUNE BERRIES, SERVICE BERRIES, etc.

1. Flowers several or numerous in the clusters; leaves obtuse or cordate at the base
 2. Leaves oblong or rounded, finely serrate.....*A. oblongifolia*, p. 99
 2. Leaves suborbicular-oblong, coarsely dentate.....*A. spicata*, p. 101
1. Flowers only 1-4 in the clusters;
 - leaves acutish or wedge-shaped at base.....*A. oligocarpa*, p. 101

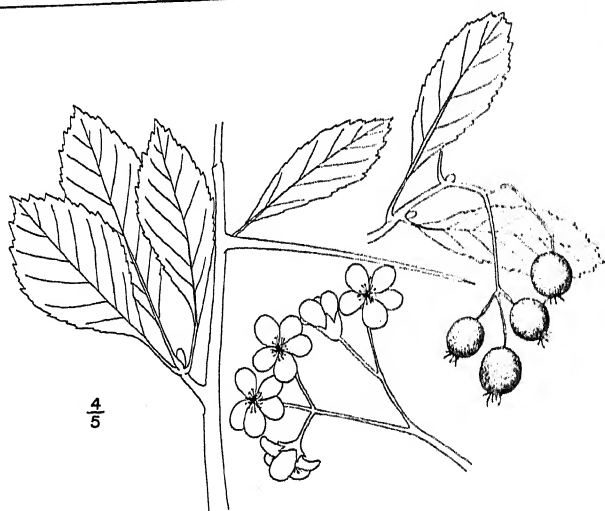
A genus of about 25 species native to the north temperate zone, three of which listed in 'Gray's Manual' and coming within our classification of shrubs may be found in Michigan.

Amelanchier oblongifolia (T.&G.) Roem. (Shad-bush). Fig. 45. A shrub or small tree 2-6 m. high; leaves deciduous, simple, alternate, oblong, usually rounded at each end or mucronate, finely and evenly serrate, white-tomentose when young, at length glabrate, pale green, especially beneath, 4-6 cm. long, 1.5-2.8 cm. broad; petioles 1-2 cm. long; flowers small, white, numerous in short rather dense, pubescent racemes; calyx 5-cleft, densely white-woolly; petals obovate or obovate-oblong, 7-10 mm. long; stamens short, numerous; styles 5, united below; pome globose, juicy and sweet. Flowers, late April, May; fruit, June, July.



AMELANCHIER OLIGOCARPA

FIG. 47



CRATAEGUS CRUS-GALLI

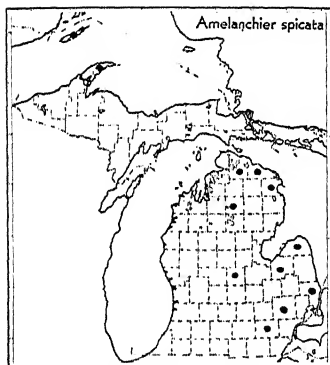
FIG. 48

Moist woods and rocky uplands New Brunswick to Virginia, Missouri and Minnesota. Michigan, infrequent throughout.



The name of the Shad-bush was given to the amelanchiers by the early inhabitants of our eastern states, because they flower at the time when the shad begin to ascend the tidal rivers. In Michigan we have no tidal rivers and no shad ascending them in the early spring. The nearest approach we have is the migration of our newly-acquired smelt, which leave the big lakes and ascend our rivers by the millions. Smelt-bush would hardly be appropriate for such a delightful shrub and I would favor leaving well enough alone and continuing to use the older and better-sounding name.

Amelanchier spicata (Lam.) C. Koch. (Low Juneberry). Fig. 46. Shrub about 1 m. high; leaves simple, deciduous, alternate, oval, elliptic or sometimes



nearly orbicular, 3-8 cm. long, 2.5-4 cm. wide, rounded at both ends, or subcordate at base, or occasionally acutely or obtusely pointed at the apex, margin coarsely dentate above the middle or often nearly to the base, young leaves covered with yellowish tomentum, which is soon deciduous as flocculent wool, older leaves mostly glabrous, veins numerous, straight and conspicuous; petiole 1-2 cm. long, tomentose; racemes numerous, 4-10 flowered; pedicels 1-2.5 cm. long in fruit; flowers white; calyx-tube bell-shaped, 5-lobed, the lobes nearly triangular; petals 5, inserted on the calyx tube, spatulate, 7-10 mm. long; stamens numerous, short; styles 5, united below; pome globose, dark-purple

to nearly black, about 7 mm. in diameter. Flowers, May, June; fruit, late July, August.

In dry rocky places Ontario to Michigan, Iowa, Pennsylvania and North Carolina. Michigan, infrequent throughout.

The fruit of the juneberries has a delicate flavor and is very palatable. When available it is used for domestic purposes, but the birds are fully aware of its fine quality, too, and for ages have been preempting it so that the feeble efforts of the human to secure a supply are rarely of much avail. However, when it is available it furnishes a particularly enjoyable treat.

Amelanchier oligocarpa (Michx.) Roem. (Oblong-fruited Juneberry). Fig. 47. A shrub 0.5-3 m. high, nearly glabrous throughout; leaves simple, deciduous, alternate, thin, oblong or oval, 3-5 cm. long, 1.5-3 cm. wide, narrowed

and acute or acutish at each end, finely and sharply serrate, green above, paler beneath; petiole stoutish, 2-10 cm. long; flowers white in 1-4 flowered racemes; pedicels slender; calyx 5-cleft, the lobes narrowly triangular, 3-4 mm. long; petals 5, obovate or oblong-obovate, 6-8 mm. long; stamens numerous, short; styles 5, united below; pome oval to pear-shaped, dark-purple with a bloom, 6-8 mm. long. Flowers, May, early June; fruit, July, August.

Cold swamps or wet rocky places Labrador to northern New England and westward to Lake Superior. Also in the mountains of Pennsylvania. Michigan, infrequent Upper and Lower Peninsulas.



The juneberries are highly variable and difficult of definite determination and, as is the case with many other such groups, the nomenclature is sadly mixed. Oliver A. Farwell in an article published in the 17th Report of the Michigan Academy of Science, 1915, lists eight varieties of *Amelanchier* in the state coming within our definition of a shrub. In part they are covered by the three species listed here and in part they separate as varieties, plants which by other authors have been included within the limits of a single species. The advanced student of systematic botany with his proclivities for intense work now looks upon most of the older species as aggregates and proceeds to separate them into smaller parts as he sees them. Others do not agree and hence the confusion. As an indication of this confusion *Amelanchier spicata* (Lam.) C. Koch listed above has had seven specific names applied to it and some of the others only a few less. This is all very confusing to the beginner and about all one can do is classify the juneberries as such and let it go at that. From my experience I believe the truth is that they hybridize so freely there are hardly two alike and unless characters are described very broadly it would be necessary to name almost every individual plant to make the descriptions fit exactly.

Crataegus L.—HAWTHORNS

'Gray's Manual' has this to say in reference to the genus *Crataegus*: "A genus of exceptional taxonomic difficulty, best developed in the great limestone areas of temperate eastern America, the numerous nearly related species still subject to widely different interpretation by specialists and capable at the present time only of a tentative and provisional treatment."

The following is quoted from 'Michigan Trees', by Charles Herbert Otis: "Owing to the complexity of the various forms in this group, the present state of uncertainty as to the value of certain characters and the questionable validity of many of the assigned names, it is thought to be beyond the scope of this bulletin to give more than a general description of the group as a whole, recommending the more ambitious student to the various manuals and botanical journals and papers for more detailed information."

With two such eminent authorities furnishing the excuse it would have been

very easy to omit the species of the genus entirely from this compilation which is intended primarily for the beginner. I felt, however, that it would be desirable to mention a few of those which are found most commonly in Michigan and regarding which there is the least uncertainty as to nomenclature. The thorns are numerous in woods and pastures and it would hardly be possible to embark on a botanizing trip where several species were not encountered.

The beginner should not be disappointed if he finds many thorns which he cannot classify. The specialists themselves have great difficulty in classifying them. Sometime ago a story was current in botanical circles to the effect that two specimens from the same shrub were sent for identification to a noted specialist who pronounced them distinct species and supplied the names. I cannot vouch for the accuracy of this story, but it at least indicates the difficulty attendant upon the classification of the members of this genus. The student who desires to attempt a classification of the thorns should be particular to have specimens from the same plant in flower and with mature fruit. The color of the anthers and the color of the fruit should also be noted. To this end it is necessary that the shrub be marked in a way to absolutely identify it. I employed brass number tags which were fastened on the shrub with copper wire when the flower specimens were taken. The specimens were numbered the same as the brass tags and later when the fruit specimens were taken they were given the same number. The brass tags were inconspicuous and nearly indestructible and were pretty sure to remain on the shrub as long as required.

While the botanists may have a difficult time with this genus, the horticulturists have no such trouble. They are not so concerned with scientific names as they are with the ornamental value of the shrubs and several species of this genus are regularly used in landscape planting. The flowers and foliage are beautiful and their scarlet fruits, which remain on into the winter, give them an additional charm. The fruits, or haws, are also valuable as food for the birds.

The thorns graft readily, which is another useful quality in their favor. Not only thorns, but pears and other fruits may be made to grow upon them. I have seen one interesting example of this sort of grafting. On some wild native thorns down back of the barns on the farm of Mr. J. C. Townsend, in Addison Township, Oakland County, Mr. Townsend has grafted several Bartlett pear scions. They are growing luxuriantly and producing fruit, or were at the time of my last visit a few years ago. Some roving botanist might think he was "seeing things" if he happened upon them without previous knowledge of their existence. It is most interesting and unusual to see the large pears growing side by side with the small haws of the thorns.

The thorn has one disadvantage as an ornamental. It is the alternate host plant for the juniper rust, and it is difficult, if not impossible to grow the red cedar and thorns in close proximity. If one or the other becomes infected it is practically impossible to obliterate the rust without getting rid of one of the host plants. Chocolate-brown "cedar-apples" are the response of the cedar to the irritation caused by the fungus in the leaf tissues. Beginning in the spring and during the warm rains for several months gelatinous orange-yellow horns, made up of hundreds of spores grow out from depressed areas on the surface of the "apples." When the rain stops and the weather clears the spores are liberated and carried by the wind to the leaves and twigs of the thorns, causing

light yellow spots on the upper surface of the leaves. Later, swellings on the under surface of the leaves discharge spores which are blown back to the cedars where they live over the winter, forming a small rounded enlargement the next spring, which increases in size during the summer, and the second spring matures as a gall or "cedar-apple." The fungus causes early defoliation of the thorns and the galls are very unsightly on the cedars. Heavy spraying is supposed to kill the spores, but complete elimination of one or the other of the host plants is the surer remedy.

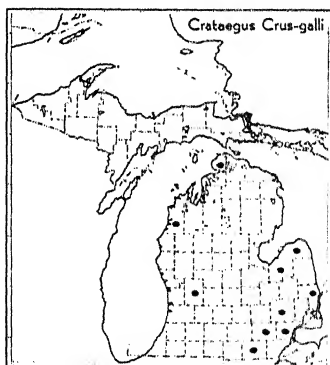
The hawthorns can be grown from seeds very easily, but it takes two years for some of the species to sprout. The fully ripened seeds should be removed from the haws and placed in seed beds in November or December. The young plants should be transplanted at the end of their first year of growth, either to nursery rows or to where they are to remain if the small plants can be properly protected.

With this rather discouraging introduction from the standpoint of the systematist we may proceed to a description of the four species selected for treatment here. Substantially all of the species of *Crataegus* are classified as small trees. This applies when they are full grown. There will be found, however, any number of plants in all the species which come well within our classification of shrubs.

Something over a thousand species have been proposed from time to time throughout the country for the genus. Beal's 'Michigan Flora' lists 41 species for the state, the most of which have been reported from one location only.

- Leaves obovate to elliptic or spatulate, dark-green and shining above;
corymbs glabrous; anthers pink.....*C. Crus-galli*, p. 104
Leaves obtuse to oblong, thin, soft, dull gray-green above;
corymbs tomentose; anthers white to pink*C. punctata*, p. 105
Leaves elliptical-ovate, rough-pubescent; corymbs villous;
anthers usually yellow.....*C. coccinea*, p. 105
Leaves broadly ovate, thin tomentose to scabrate above;
corymbs densely tomentose; anthers yellow.....*C. mollis*, p. 107

***Crataegus Crus-galli* L. (Cock-spur Thorn).** Fig. 48. Shrub or small tree; bark dark-gray, scaly; spines many, strong, straight, 3-18 cm. long; stipules deciduous; leaves simple, alternate, deciduous, obovate to elliptical, leathery, dark-green and shining above, glabrous or occasionally slightly pubescent, glandless, acute or rounded at the apex, wedge-shaped at the base, sharply serrate toward the base, 2-10 cm. long, 1-4 cm. wide; petiole slightly winged above, glandless, 1-2 cm. long; corymbs many-flowered, usually glabrous; flowers white, about 1.5 cm. wide; calyx-tube campanulate, 5-lobed, the lobes lanceolate-acuminate, glabrous or somewhat pubescent; petals 5, roundish; stamens 10-20; anthers generally pink; styles 1-3; fruit ellipsoidal-ovoid to subglobose, about 1 cm. thick,

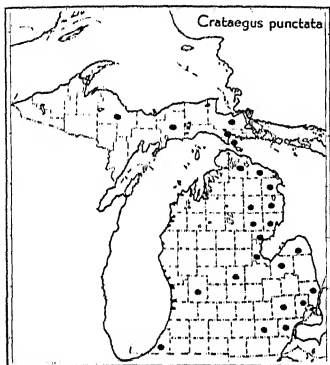


greenish to red, flesh hard and dry; nutlets generally 2, 8-9 mm. long, strongly ridged on the back. Flowers, May, June; fruit, October.

Generally in sandy or gravelly soil, New York to Ontario, Michigan, eastern Kansas south to Georgia. Michigan, common throughout.

This species is extremely variable in leaves and fruit and many names have been proposed for it. The Cock-spur Thorn is extensively used in ornamental planting and is a very satisfactory shrub in any suitable location.

Crataegus punctata Jacq. (Large-fruited Thorn. Dotted Haw). Fig. 49. Small flat-topped tree or shrub; bark grayish-brown; spines 2-7 cm. long, straight,



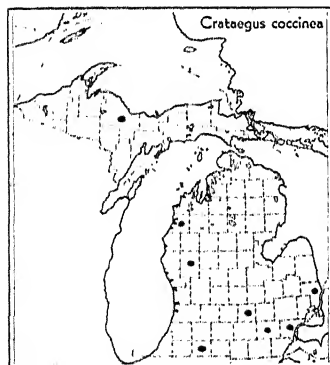
usually few; stipules deciduous; leaves simple, alternate, deciduous, obovate to oblong, impressed-veined above, dull gray-green, 2-8 cm. long, 1.5 cm. broad, mostly pubescent beneath, especially along the veins, acute or acuminate at the apex, sharply wedge-shaped at the base, sharply and double serrate above the middle, or slightly lobed; petioles 1-2 cm. long, slightly winged above, pubescent; corymbs tomentose, many-flowered; flowers white, about 2 cm. wide; calyx-tube pubescent, its 5 lobes linear-lanceolate and less pubescent, mostly entire; petals, 5, spreading, rounded; stamens about 20; anthers white to pink; styles 3-4; fruit short-ellipsoid, yellow or red, 1.2-2.5 cm. thick; nutlets 3-4,

slightly ridged on the back, 6-7 mm. long. Flowers, May, June; fruit, October.

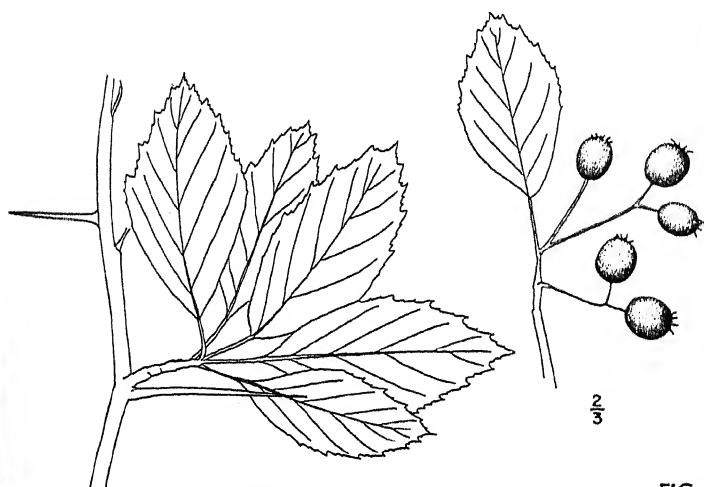
Quebec to Pennsylvania, Minnesota, Iowa, Illinois, south to Georgia and Kentucky. Michigan, common in the southern portion.

This is also an inconstant species and several varieties have been proposed.

Crataegus coccinea L. (Scarlet Thorn, Red Haw). Fig. 50. Irregularly topped shrubs or small trees; bark gray or brownish; spines occasional, stout 3-5

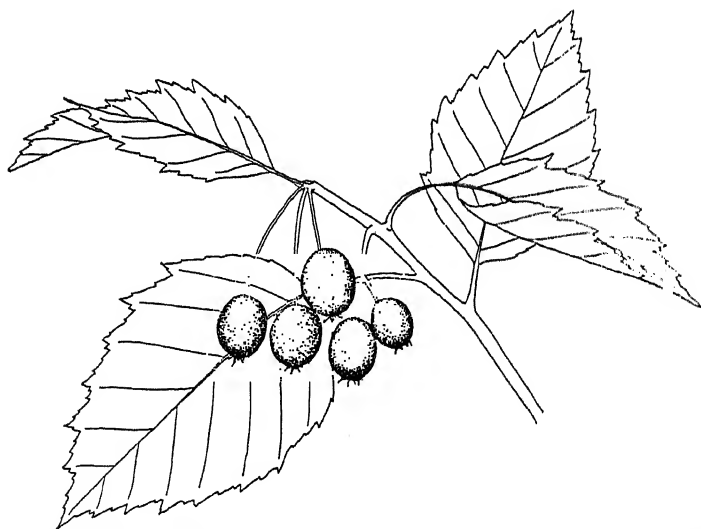


cm. long; stipules deciduous; leaves simple, alternate, deciduous, broadly ovate, acute or acuminate at the apex, broadly wedge-shaped to truncate at the base, 2-7 cm. long, 1.5-5 cm. wide, rough pubescent, becoming scabrous above and nearly glabrous beneath, doubly serrate or lobed; petioles 1-3 cm. long, glandular, slightly winged above; corymbs few-flowered, villous; flowers white, about 2.5 cm. broad; calyx-tube villous, 5-lobed, the lobes lance-acuminate or acute, strongly toothed at the apex; petals 5, spreading, rounded; stamens about 10; anthers light-yellow; styles 3-5; fruit subglobose to ellipsoidal, 8-12 mm. in diameter, red,



CRATAEGUS PUNCTATA

FIG. 49



CRATAEGUS COCCINEA

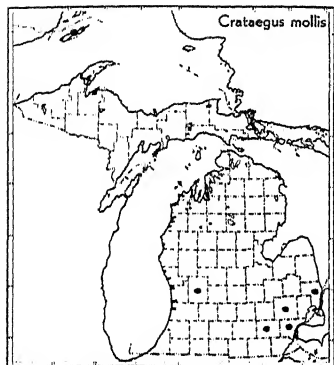
FIG. 50

pubescent or becoming nearly glabrous; nutlets 3-4, 5-7 mm. long, strongly ridged on the back. Flowers, May, June; fruit, October.

Rocky woods and thickets Newfoundland to Manitoba, south to Florida and Texas. Michigan, common throughout.

The Scarlet Thorn excels in decorative value and is extensively used in ornamental planting.

Crataegus mollis (T. & G.) Scheele. (Red-fruited Thorn, Downy Thorn).
Fig. 51. A shrub or small tree with spreading branches; spines somewhat curved,



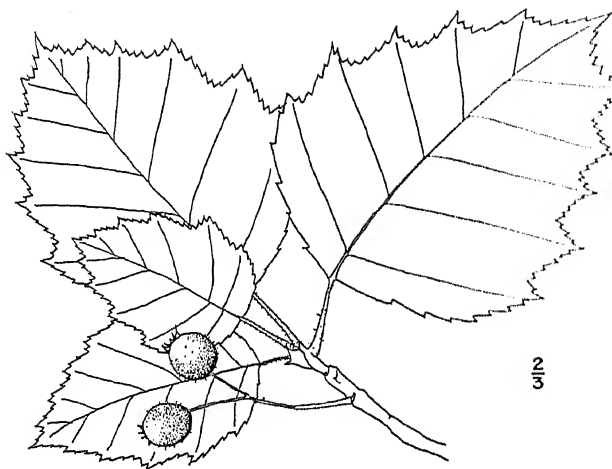
3-5 cm. long, blackish-brown; stipules deciduous; leaves simple, alternate, deciduous, yellow-green when young, broadly ovate, 4-13 cm. long, 4-10 cm. wide, cordate to truncate at the base, incised and sharply serrate with gland-tipped teeth, roughish above, densely tomentose beneath; petioles 2-5 cm. long, pubescent or tomentose; corymbs many-flowered and densely tomentose; flowers white, about 2.5 cm. wide; calyx ring 5-lobed, the lobes with glandular-serrate acuminate tips; petals 5, spreading, rounded; stamens about 20; anthers yellow; styles 4-5; fruit short-ellipsoid to subglobose, scarlet, 1.5-2.5 cm. thick, the calyx-lobes usually deciduous, flesh yellow; nutlets mostly 5,

7-8 mm. long, obscurely ridged on the back. Flowers, May; fruit, August, September.

Southern Ontario to South Dakota, south to Tennessee and Arkansas. Michigan, common in the central portion.

This is one of the best of the native thorns for horticultural use and development.

The foregoing does not even scratch the surface of the species of thorns which may be found in Michigan. C. S. Sargent, Director of the Arnold Arboretum wrote a monograph on "Crataegus in Southern Michigan" which was published by the State Board of Geological Survey in its report for 1906. In this work he lists fifty-five species from the southern part of Michigan, of which twenty-three are proposed new species and only three appear in the seventh edition of 'Gray's Manual'. These are *C. mollis* (T.&G.) Scheele, *C. punctata* Jacq., and *C. tomentosa* L., all specific names of long standing. Only eighteen of the forty-one species of *Crataegus* given in Beal's 'Michigan Flora' are included in Sargent's list. Therefore thirty-seven new species were added by his work, making a total of seventy-eight for the state. And he says: "Judging from the material which I have seen from other parts of the Lower Peninsula and which is too incomplete for critical study, it seems probable that there are still in the southern part of the state a large number of unnamed species, and when these are known it will not be surprising if the flora of Michigan is found to contain a much larger number of species than are now described." Prof. Sargent in the above refers only to the southern portion of the state. The Upper Peninsula has



CRATAEGUS MOLLIS

FIG. 51



POTENTILLA FRUTICOSA

FIG. 52

many hawthorns among which a critical study would no doubt reveal many new species in addition to those already known from there.

Oliver A. Farwell (1930), sums up his experience with *Crataegus* in Michigan in part as follows: "This genus is well distributed through southern Michigan. No systematic study of the species of the whole state has ever been made; it would be mere guess work to suggest the number of the named and described species of North America that might be found in Michigan." He follows this statement with a list of fifty-two species and varieties which he has found in Michigan, both Upper and Lower Peninsulas.

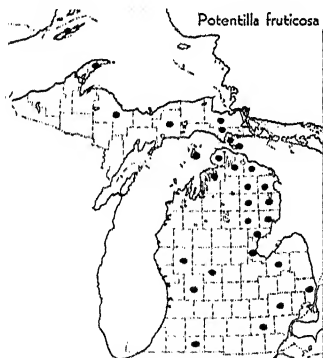
W. W. Ashe also worked extensively with Michigan *Crataegi* having named eighteen of the forty-one species listed in Beal's 'Michigan Flora.' Some of these were described in his 'New East American Thorns' (1902).

It will be seen from the above that there is abundant opportunity for original systematic work in this field and it is hoped that some ambitious amateur will accept the challenge.

Potentilla L.—CINQUEFOILS

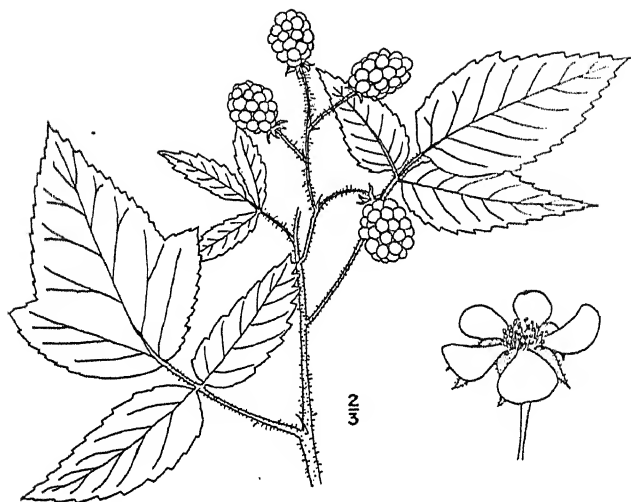
A genus of about 150 species, nearly all native to the north temperate zone. Eight species are listed in Beal's 'Michigan Flora' as native of Michigan, all of which are herbaceous except the following.

Potentilla fruticosa L. (Shrubby Cinquefoil). Fig. 52. Shrubs with numerous more or less erect branches, 3-10 dm. high; bark reddish-brown and shreddy; leaves alternate, pinnate, deciduous, 1-3 cm. long; leaflets 5-7, mostly 5, crowded, oblong-lanceolate, entire, 1-2 cm. long, acute or acutish at each end, silky-pubescent, the margins revolute; flowers terminal, closely cymose, or solitary, about 2 cm. across; calyx-tube flat, deeply 5-cleft, with a bractlet in each sinus, appearing 10-cleft; petals yellow, orbicular; stamens 15-20; style lateral, filiform; stigma four-lobed; achenes numerous, collected in heads densely covered with long straight hairs. Flowers, June to September; fruits the same period.



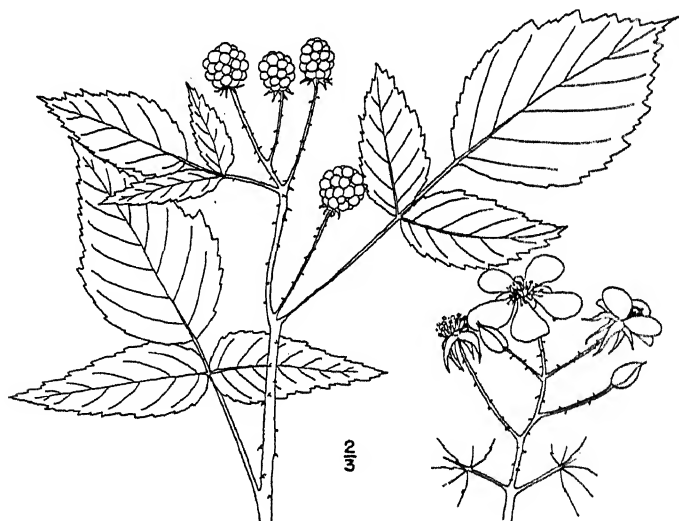
In swamps or moist rocky places Greenland and Labrador to Alaska, south to New Jersey, Pennsylvania, the Great Lakes region, Iowa, Arizona and California. Michigan, common throughout.

The late flowering period of the Shrubby Cinquefoil makes it a desirable shrub for ornamental planting, and it is frequently used when a suitable habitat is available. While we think of this species as one favoring low, wet ground it practically always edges out onto the higher ground surrounding a swamp where it grows in profusion.



RUBUS IDAEUS VAR. ACULEATISSIMUS

FIG. 53



RUBUS OCCIDENTALIS

FIG. 54

Rubus [Tourn.] L.—BRAMBLES, BLACKBERRIES, RASPBERRIES

A genus of some 200 species of wide distribution, but mostly in the temperate zone. The species are variable and the nomenclature is sadly confused. As an evidence of how busy the specialists have been over 1500 species have been named by various authors from time to time. 'Gray's Manual' lists 38 species for the entire United States and Britton and Brown, 29 species for the same territory. Beal's 'Michigan Flora' lists 16 species for the state; of these 9 of more general distribution are selected for treatment here. Those who wish to pursue the study of the genus further are referred to the manuals and special monographs.

The stems of the brambles are woody, but they do not live on from year to year bearing fruit as does the huckleberry or other such shrubs. The stems live about a year and a half and die after bearing fruit, while the roots live on indefinitely. The new growth develops rapidly until normal size has been reached, then growth stops. These stems are simple the first year. Branches are developed the second year upon which the fruit is borne.

1. Leaves simple, 3-5 lobed; flowers large, showy
 2. Flowers purple-rose color *R. odoratus*, p. 113
 2. Flowers white *R. parviflorus*, p. 113
1. Leaves pinnately 3-7 foliate
 3. Fruit falling off whole from the dry receptacle (Not separating easily in *R. triflorus*.)
 4. Stems essentially herbaceous, 1-3 flowered; leaves not white beneath; flowers white *R. triflorus*, p. 115
 4. Stems shrubby, many-flowered; leaves white-pubescent beneath
 5. Stems upright, beset with stiff, straight bristles; not glaucous; fruit red *R. idaeus* var. *aculeatissimus*, p. 111
 5. Stems recurved, rooting at the tips; prickles hooked; glaucous all over; fruit black *R. occidentalis*, p. 112
 3. Fruit not separating from the receptacle (except in *R. triflorus*, which does not separate easily.)
 6. Stems erect
 7. Pedicels glandless or usually so; fruit black, very pulpy *R. canadensis*, p. 117
 7. Pedicels copiously glandular-hispid; fruit black, less pulpy *R. allegheniensis*, p. 115
 6. Stems trailing or decumbent
 8. Stems bristly or weakly prickly
 9. Fruit red or reddish, drupelets small *R. hispidus*, p. 117
 9. Fruit black, drupelets large and juicy *R. villosus*, p. 119
 8. Stems not bristly or prickly; fruit red *R. triflorus*, p. 115

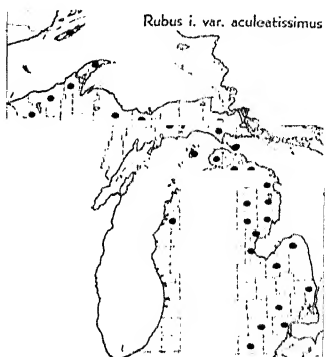
Rubus idaeus L. var. *aculeatissimus* [C. A. Mey.] Regel & Tiling. (Wild Red Raspberry). Fig. 53. Stems shrubby, biennial, branched, 5-20 dm. high; new growth more or less bristly, red with a bloom, the older stems with small hooked prickles, dull reddish-brown; stipules narrow, deciduous; leaves deciduous, alternate, 3-5 foliate, leaflets ovate or ovate-oblong, acuminate, sharply and irregularly serrate, or slightly lobed, rounded at the base, 3-7 cm. long, the lateral sessile, when mature bright yellow-green above, whitish-pubescent beneath; petiole bearing very small bristles and prickles, 4-7 cm. long; inflorescence racemose or paniculate, loose, pubescent and more or less bristly; pedicels slender, curved in fruit; flowers perfect, white, about 1 cm. in diameter; calyx deeply 5-parted, the segments lanceolate-acuminate, bristly hispid; petals

5, about as long as the sepals; stamens numerous; fruit elongate-hemispheric, light red, separating easily from the white receptacle when ripe; drupelets numerous, tomentose, edible. Flowers, May, July; fruit, July, September.

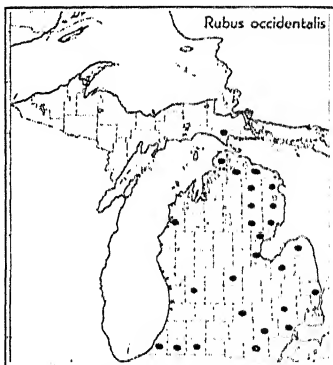
Thickets, hillsides and rocky situations Labrador to Manitoba, British Columbia, New Jersey, Pennsylvania, region of the Great Lakes and south to Virginia, North Carolina and to New Mexico. Michigan, common throughout.

This is the common red raspberry of our waste lands and fence corners. It is exceedingly persistent and in some situations might be classed as a pestiferous weed. It is the progenitor of several cultivated raspberries, including the Cuthbert and Hansall varieties.

Occasionally it will be found with white fruit. This has been named: forma *albus* (Fuller) Fernald. A colony with white fruit persisted for a long time in a real estate subdivision in Bloomfield Township, Oakland County.



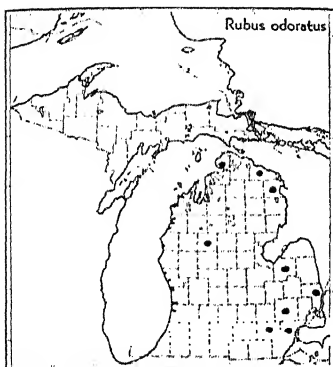
Rubus occidentalis L. (Black Raspberry). Fig. 54. Stems biennial, slender, recurved and under favorable conditions rooting at the tips, glaucous all over, sometimes reaching a length of 3-4 m., armed with hooked prickles, not bristly; stipules deciduous; leaves deciduous, alternate, 3-foliate, or very rarely 5-foliate; leaflets ovate, pointed, coarsely cut and irregularly serrate, whitened-downy below, glabrous or nearly so above, the lateral somewhat stalked; petioles with small prickles; inflorescence corymbose, compact, mostly terminal; pedicels short, ascending or erect in fruit; flowers perfect, white, about 1 cm. broad; calyx 5-parted, the lobes acute and reflexed, tomentose, persistent; petals 5, shorter than the sepals, deciduous; stamens numerous; fruit black, hemispheric, variable in size, separating easily from the receptacle when ripe, edible. Flowers, May, June; fruit, July.



Copses, fence rows and waste ground New Brunswick to Quebec, Ontario, Georgia and Missouri. Michigan, common throughout.

The Black Raspberry is one of our best wild fruits, and few concoctions can equal wild black raspberry jam. It has a delicious flavor all its own. Like the Wild Red Raspberry this is the progenitor of several cultivated raspberries, including the well-known Gregg and Hilborn varieties. Occasionally it will be found with yellow or amber fruit. Thus we have the strange combination of a yellow black raspberry. This has been named: forma *pallidus* (Bailey) Robinson.

Rubus odoratus L. (Purple-flowering Raspberry). Fig. 55. Branched shrubs, erect, 1-1.6 m. high; bark becoming loose and stringy; young shoots, flower



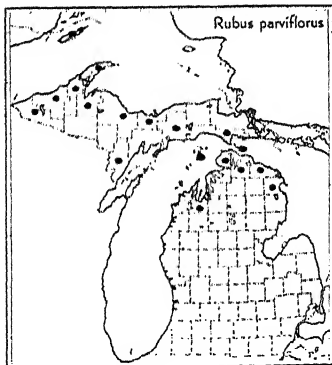
branches and petioles thickly covered with glandular pubescence; leaves deciduous, alternate, simple, 12-17 cm. long and broad, 3-5 lobed, cordate at the base, lobes serrate, pointed, the middle one longer than the others, pubescent both surfaces; petiole long, very pubescent; inflorescence a loose, terminal corymbose or paniculate cluster; flowers perfect, rose-purple, 3-5 cm. broad; bracts membranous; calyx deeply 5-parted, densely covered with red, glandular hairs, the lobes tipped with a long, slender appendage; petals 5, rounded, inserted on the disk of the calyx; stamens many; filaments purple; style purplish; fruit red when ripe, depressed hemispheric, acid dry and unpalatable. Flowers,

May, September; fruit, July, September.

In rocky woods Nova Scotia to Ontario and Michigan, south to Georgia and Tennessee. Michigan, throughout, more common in the northern part of Lower Peninsula and in the Upper Peninsula.

The Purple-flowering Raspberry makes a desirable cultivated shrub, but should always be given a shady place. Its rose-like blossoms are very attractive among its ample maple-shaped leaves. Like the other raspberries it spreads by underground stems which send up shoots in abundance.

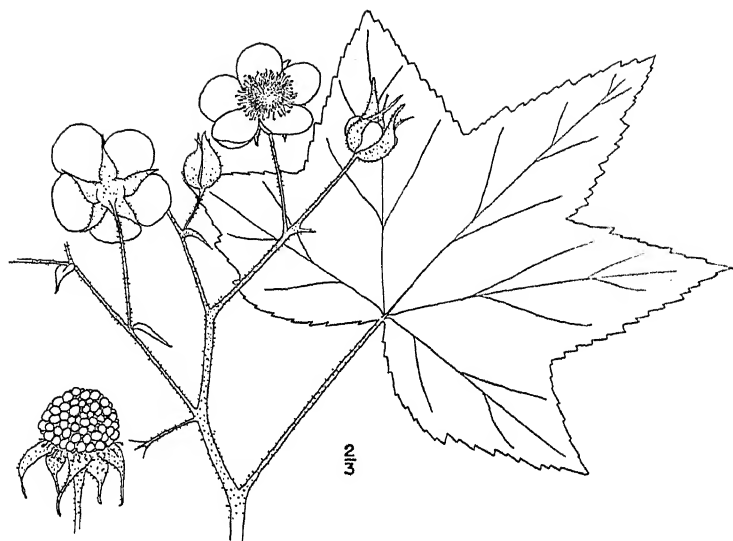
Rubus parviflorus Nutt. (Salmon Berry, Thimbleberry). Fig. 56. Erect, branched shrubs, 1-2 m. high; young shoots moderately glandular, scarcely



bristly, older stems with gray shreddy bark; leaves deciduous, alternate, simple, cordate at base, 3-5 lobed, 7-20 cm. long and about as broad, lobes acute or obtusish, rarely acuminate, all approximately the same length, coarsely and unequally serrate, sparsely pubescent both sides; petiole glandular-hispid; inflorescence corymbose, few-flowered; flowers perfect, white, 3-5 cm. in diameter; calyx 5-lobed, the lobes tipped with a long, slender appendage; petals oval, 15-30 mm. long; stamens numerous; fruit depressed-hemispheric, red when ripe, separating from the receptacle, very tart. Flowers, June, July; fruit, August, September.

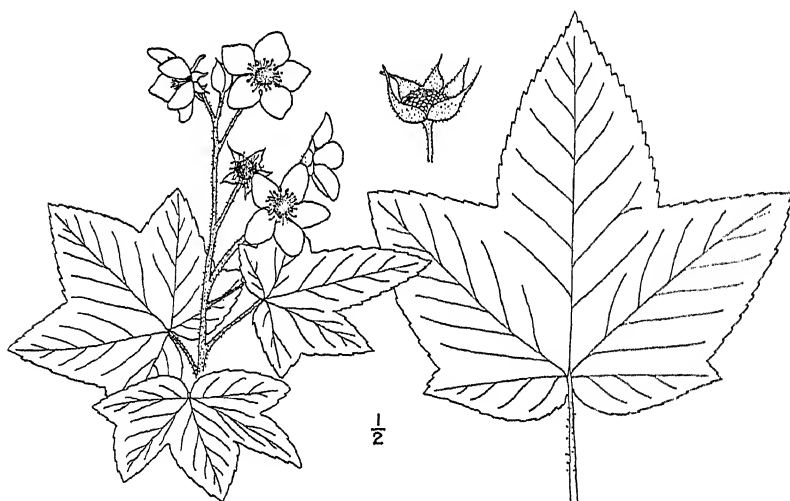
Rocky woods, shores, etc., western Ontario, northern Michigan, Minnesota and westward to Alaska and California. Michigan, upper part of Lower Peninsula and the Upper Peninsula.

The specific name of the Salmon Berry, *parviflorus*, means small-flowered,



RUBUS ODORATUS

FIG. 55

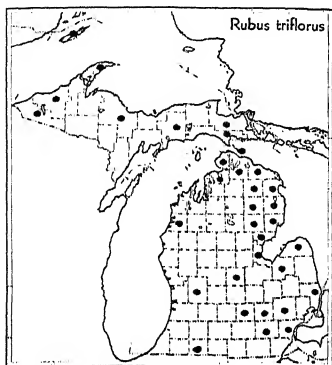


RUBUS PARVIFLORUS

FIG. 56

which is most unfitted to this plant, as it has comparatively large flowers. In the north where the berries are abundant they are used for jam.

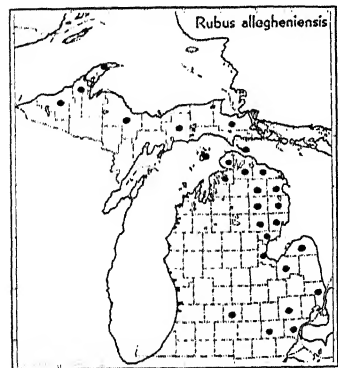
Rubus triflorus Richards. (Dwarf Raspberry). Fig. 57. Stems trailing or ascending, unarmed, herbaceous or somewhat woody, those with flowers erect, 1-4 dm. high, sterile more elongated, sparsely pubescent; stipules oval, entire or few-toothed, prominent; leaves deciduous, alternate 3- or rarely 5-foliate; leaflets rhombic-ovate, glabrous or nearly so, the terminal wedge-shaped, acute, the lateral mostly rounded at the base, coarsely and doubly serrate, thin; inflorescence slender, 1-3 flowered, glandular-pubescent; flowers white, 8-12 mm. broad; calyx lobes 5-7, acuminate, reflexed; petals 5-7 erect, spatulate-oblong, somewhat exceeding the sepals; stamens numerous; fruit red-purple, about 12 mm. long, the rather large drupelets not separating easily from the receptacle. Flower, May, July; fruit, July, August.



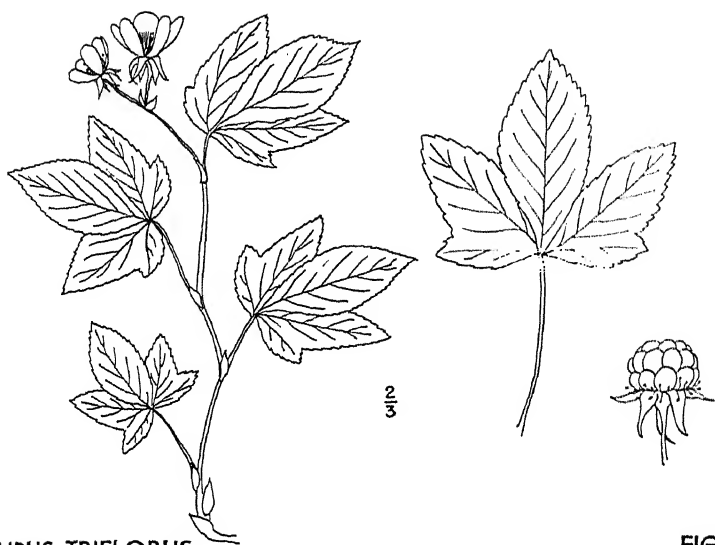
In swamps Newfoundland to Alaska, south to New Jersey, Iowa and Nebraska. Michigan, frequent throughout.

This little creeping raspberry is found in swamps and low wet woods. Its fruit does not separate easily from the receptacle and yet it is not like the blackberries, the fruit of which does not separate from its receptacle at all. It is therefore intermediate between the blackberries and the raspberries. The fruit is edible, although not particularly attractive.

Rubus allegheniensis Porter. (High-bush Blackberry). Fig. 58. Shrubby, 1-2 m. tall, the stems somewhat arching, old canes purplish with stout straightish prickles, pubescent or becoming glabrous toward the base; leaves alternate, deciduous, 3-7 foliate, the leaflets ovate to ovate-lanceolate, all subcordate or rounded at the base, acute or acuminate, coarsely and unequally serrate, the terminal somewhat larger than the lateral, villous above, velvety beneath; petiole 5-12 cm. long, with stout prickles; inflorescence glandular-pubescent, racemose, leafy-bracted below; flowers white, 2.5-3.5 cm. broad; calyx persistent, its 5 lobes 6-8 mm. long, more or less pubescent; petals obovate, much exceeding the calyx-lobes; stamens numerous, inserted on the calyx; fruit, black, thimble-shaped, 1.2-2.5 cm. long, the drupelets not separating from the

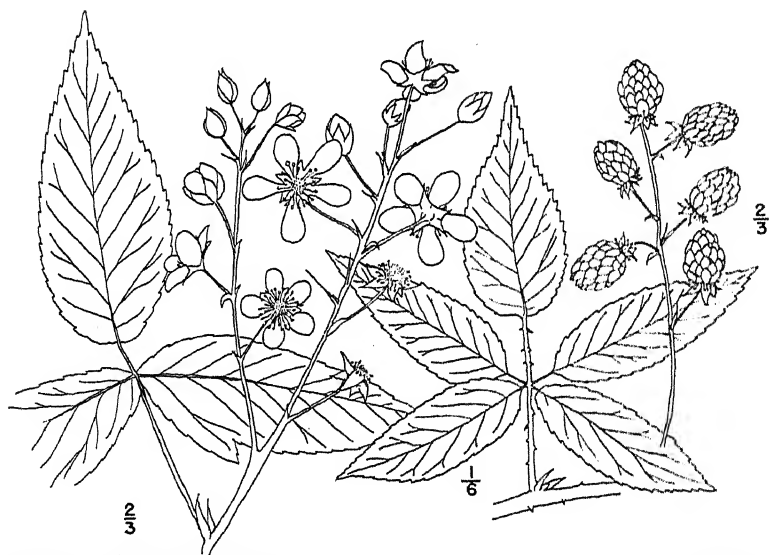


receptacle, but falling from the calyx together, of good flavor and edible. Flowers, May, June; fruit, July, August.



RUBUS TRIFLORUS

FIG. 57



RUBUS ALLEGHENIENSIS

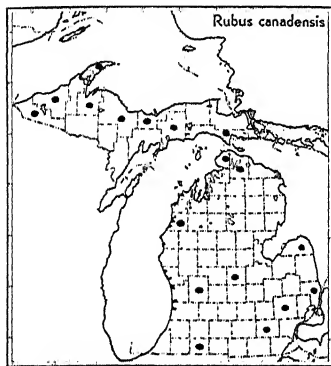
FIG. 58

Dry, open thickets and recent clearings Nova Scotia to Ontario, Minnesota south to North Carolina and Arkansas. Michigan, very common central portion, rare in Upper Peninsula.

This is the common blackberry of our fence rows, roadsides and clearings. It is exceedingly common and persistent and from it have sprung some of the cultivated blackberries of our gardens. Its fruit is delicious and blackberry jam is an old favorite.

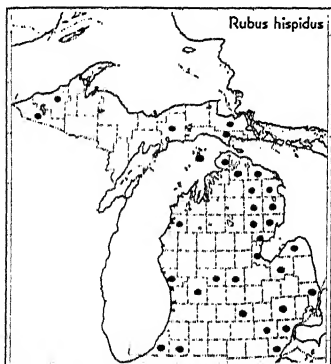
The blackberry group is very confusing to the beginner, and to distinguish among the varying forms is the task of the expert. The experts do not always agree, either, and it is likely that the group will always be more or less of a problem to the systematic botanist. Its study may be carried further than this bulletin permits by referring to the manuals or to the special monographs.

Rubus canadensis L. (Millsbaugh's Blackberry, Thornless Blackberry). Fig. 59. Stems erect or recurving 1.5-3 m. high, wand-like, entirely unarmed

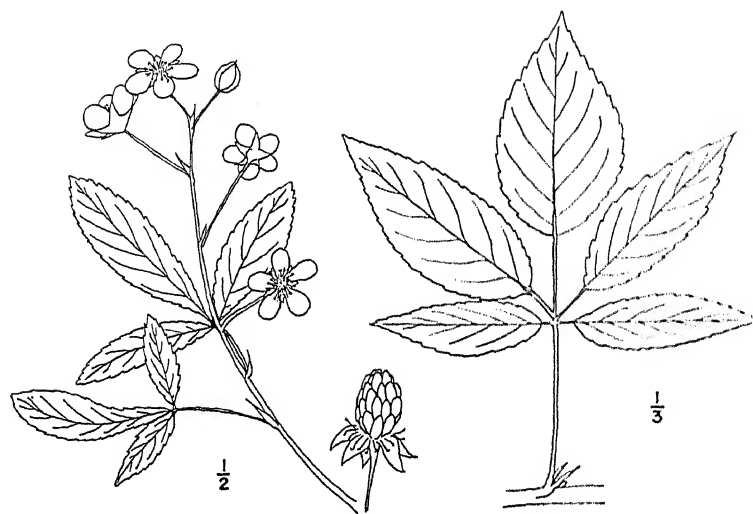


or with a few weak prickles, glabrous or the younger shoots scurfy-pubescent; leaves alternate, deciduous, palmately 3-5 foliate, leaflets glabrous both sides, thin, oval, long acuminate or acute, rounded or narrowed at the base, up to 15 cm. long and 5 cm. wide, sparsely but not deeply serrate, petiolule of the terminal leaflet 4-10 cm. long; petiole long; inflorescence loosely racemose, long-cylindric, leafy-bracted at the base; pedicels slender, ascending, fine pubescent; flowers white, 2.5-4 cm. broad; calyx-lobes lanceolate, acuminate; petals obovate; stamens numerous; fruit subglobose to short-cylindric, black, very pulpy, 1.5-2.5 cm. long, the drupelets not separating from the receptacle, edible. Flowers, June, August; fruit, August, September.

In thickets and woods Newfoundland to Michigan and in the uplands to North Carolina. Michigan, frequent throughout.

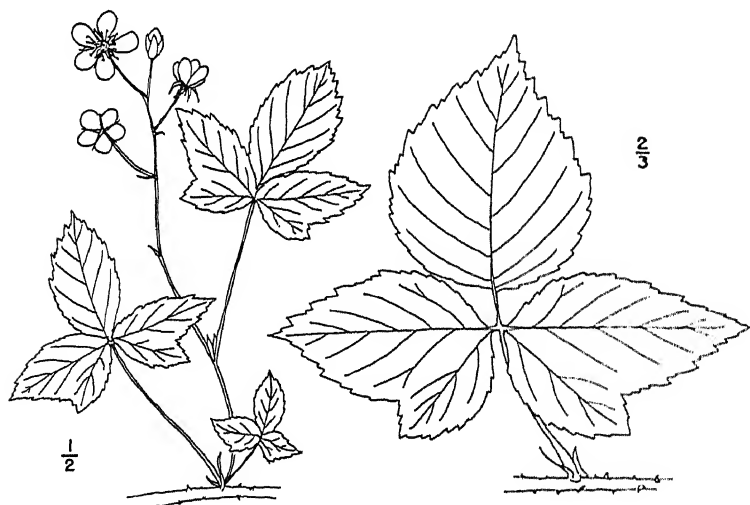


Rubus hispidus L. (Hispid or Running Swamp Blackberry). Fig. 60. Stems slender, prostrate and trailing, more or less beset with retrorse prickles; branchlets erect or ascending, 1-3 dm. high; leaves deciduous, although sometimes persisting through the winter, 3- or rarely 5-foliate; leaflets glabrous on both surfaces, somewhat shining above, firm, obovate, obtuse at the apex, narrowed or sometimes rounded at the base, 1-4 cm. long, sharply serrate above the middle; petiole glabrous or nearly so; inflorescence terminal or axillary, racemose-corymbose, few-flowered, nearly or entirely leafless, the pedi-



RUBUS CANADENSIS

FIG. 59



RUBUS HISPIDUS

FIG. 60

cels and rachis pubescent and often bristly; flowers white, 1.5-2 cm. broad; calyx-lobes 3-4 mm. long, reflexed, pubescent; petals broadly obovate, exceeding the calyx-lobes; stamens numerous; fruit small, reddish-purple; drupelets glabrous, sour, not separating from the receptacle. Flowers, June, July; fruit, August.

Low woods and swampy meadows, Nova Scotia to Georgia, west to Minnesota and Kansas. Michigan, throughout; very abundant in central portion.

This trailing blackberry is very common. Although the leaves are deciduous the foliage looks evergreen and sometimes persists through the winter. In the autumn the foliage takes on many brilliant and changing tints.

Rubus villosus Ait. (Dewberry, Low Running Blackberry). Fig. 61. Stem trailing, shrubby, often 1-4 m. long, glabrous, armed more or less with reflexed



straightish prickles; branchlets upright 1-3 dm. high, more or less pubescent and sometimes prickly and glandular; leaves deciduous, 3- or rarely 5-foliate; leaflets ovate, oval or ovate-lanceolate, thin, acute or somewhat obtuse at the apex, rounded or narrowed at the base, mostly sparingly pubescent both sides, doubly dentate-serrate; petiole 3-6 cm. long, more or less prickly; inflorescence a leafy, few-flowered corymbiform raceme, 2-3 cm. broad or the flowers sometimes solitary; flowers white, about 2.5 cm. broad; calyx-lobes ovate, acute, shorter than or exceeding the petals, pubescent; petals obovate to elliptic about 10-15 mm. long; stamens numerous, generally exceeded by the

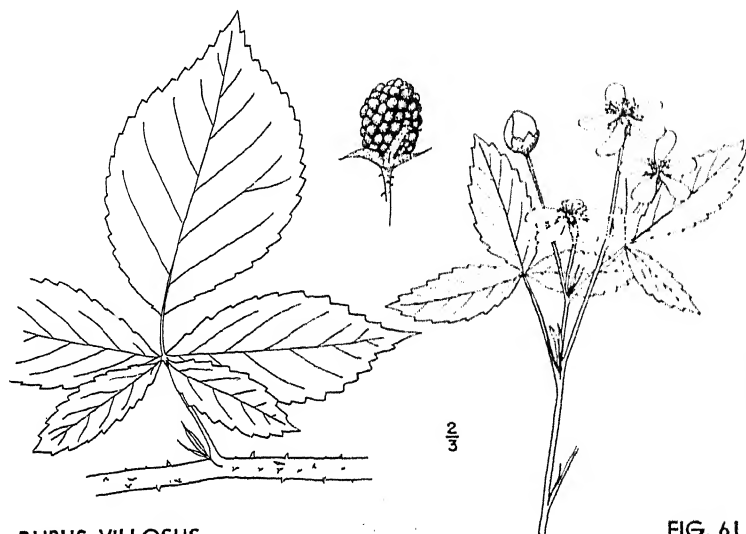
stigmas; fruit subglobose to short-cylindric, black, juicy and delicious, 1-1.5 cm. long; drupelets not separating from the receptacle. Flowers, May, June; fruit, July, August.

Dry, open soil southern Maine to Minnesota, south to Virginia and Missouri. Michigan, throughout.

This is the common Dewberry of our dry, open fields, banks and roadsides. It grows usually in poor soils, particularly in fields which were formerly cultivated. It is extremely variable and has so puzzled taxonomists that it would seem to be entitled to first prize for the number of its synonyms. L. H. Bailey in his comprehensive work on the North American blackberries lists it as *Rubus flagellaris* Willd. and enumerates nine synonyms. In addition he has separated and named three varieties which had not heretofore been recognized. It would almost seem the truth is that there are practically no two alike and one seeking to draw too fine descriptions would be naming individuals rather than species.

Rosa [Tourn.] L.—ROSES

A very large genus, native of the northern hemisphere. Because of its beauty of form, color and fragrance the rose is undoubtedly the most universally admired and cultivated ornamental plant known to our gardens. It has been in cultivation from the earliest times of which we have record. The species roses



RUBUS VILLOSUS

FIG. 61



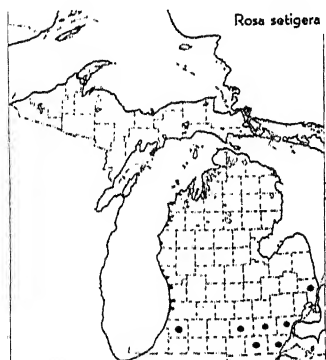
ROSA SETIGERA

FIG. 62

are extremely variable and freely hybridize whenever they occur together. These two characteristics have made it comparatively easy to develop varieties of the rose and literally thousands have been introduced and named. Many of these become obsolete and are superseded by better varieties. They go out of style much the same as suits and hats. The roses of my grandmother's garden could scarcely be compared to the beautiful varieties now in cultivation. Volumes have been written about the rose and devotees form societies to study and promote its development and cultivation.

The wild roses from which have been developed the myriads of horticultural varieties, although not as elaborate, are scarcely less beautiful. Our native roses vary greatly, and many have been separated and named as species and varieties. In keeping with the general policy for compiling this bulletin only those species which are given in 'Gray's Manual,' and which are well distributed in Michigan are treated here. Eileen Whitehead Erlanson (1928), of the University of Michigan, has made a special study of the species of *Rosa*. In her paper she proposes two new species and one variety, as follows: *Rosa Michiganensis*, *Rosa Schuetteana* and *Rosa blanda* Ait. var. *Hermanni*. All of these roses are found in Michigan, but are not included in this bulletin because of the policy of limiting species to those given in 'Gray's Manual.' The student desiring to go further than this bulletin with roses would do well to secure the various publications by Mrs. Erlanson on this genus.

1. Styles united in a protruding column; leaflets 3, very rarely 5; stems climbing.....*R. setigera*, p. 112
1. Styles distinct; leaflets 5-11; stems erect or spreading
 2. Sepals persistent, converging after flowering
 3. Leaf-rachis glandular-puberulent or bristly; fruit top-shaped at base.....*R. acicularis*, p. 123
 3. Leaf-rachis softly and finely villous or tomentose; prickles mostly few or none.....*R. blanda*, p. 123
 2. Sepals falling from the mature fruit, spreading after flowering
 4. Leaf-rachis very glandular; prickles numerous, strong and hooked; leaflets rarely 2 cm. long, doubly serrate.....*R. rubiginosa*, p. 125
 4. Leaf-rachis puberulent or glabrous, scarcely if at all glandular
 5. Leaflets finely serrate, spines stout and recurved.....*R. carolina*, p. 125
 5. Leaflets coarsely serrate; spines slender.....*R. humilis*, p. 127

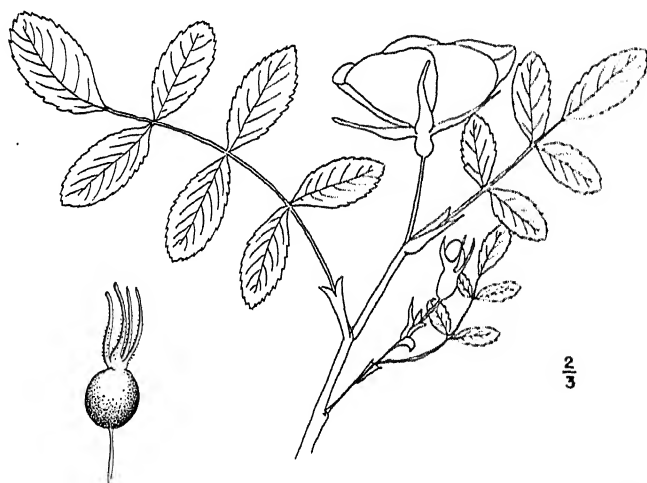


Rosa setigera Michx. (Michigan Rose, Prairie Rose, Climbing Rose). Fig. 62. Stems climbing or sprawling, up to several meters long, armed with scattered curving or straightish prickles, bristles none; twigs often glandular-pubescent; stipules very narrow; leaves alternate, deciduous, mostly 3-foliate, occasionally 5-foliate; leaflets mostly ovate, acute or obtusish at the apex, rounded at the base, 3-7 cm. long, sharply serrate, thick, smooth or downy beneath; petiole prickly, glandular-pubescent; inflorescence corymbose, with many flowers, pedicels covered with glandular hairs; flowers varying shades of pink to nearly white, about 6 cm.



ROSA ACICULARIS

FIG. 63



ROSA BLANDA

FIG. 64

in diameter, not fragrant; calyx-lobes 5, ovate, acute, glandular, finally reflexed and deciduous; petals 5, obcordate, spreading; stamens many, inserted on the hollow ring which lines the calyx-tube; styles joined in a protruding column, as long as the stamens; fruit red, globose more or less glandular, 8-10 mm. in diameter. Flowers, June, July; hips ripe in autumn.

In thickets and on prairies southern Ontario to Ohio, Wisconsin and Nebraska, West Virginia, Florida and Texas. Michigan, central and southern portion, rather rare.

This is our only native climbing rose. It is the progenitor of several of our most valuable cultivated climbing roses. Michigan is highly honored in having such a beautiful and useful plant bear its name.

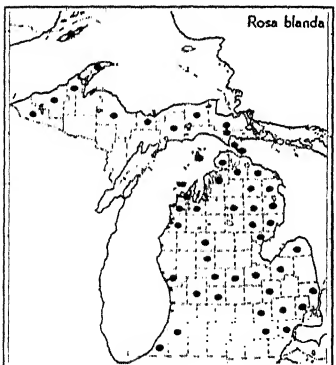
Rosa acicularis Lindl. (Prickly Wild Rose). Fig. 63. Shrubs 3-12 dm. high, bushy, the stems and branches very prickly, greenish or reddish; stipules generally broad; leaves alternate, deciduous, 3-7



foliate, the rachis glandular; leaflets 2-4 cm. long, oval or oval-lanceolate, broadly elliptical to oblong-lanceolate, obtuse at the apex, rounded or subcordate at the base, usually pale and somewhat resinous-puberulent beneath, simply or doubly serrate; petiole glandular; flowers 5-7 cm. in diameter, solitary or rarely 2-3 in a cluster; pedicel glabrous or rarely glandular; calyx-lobes lanceolate, acuminate or broadened at the tip, entire or few-toothed, persistent and erect upon the fruit; petals bright pink; stamens many; styles distinct; fruit globose or ellipsoid, about 1.5 cm. in diameter, red, generally glabrous. Flowers, May, June; hips

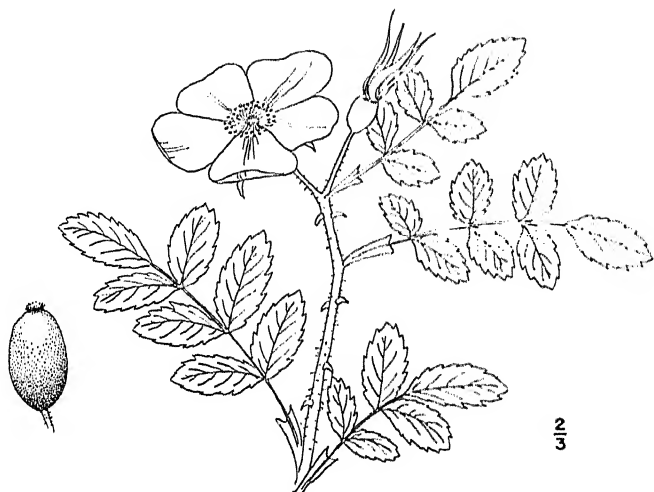
ripe in autumn.

Anticosti to Ontario, Alaska, northern Michigan, Minnesota, south in the Rocky Mountains to Colorado and Idaho. Michigan, Upper Peninsula and northern part of the Lower Peninsula.



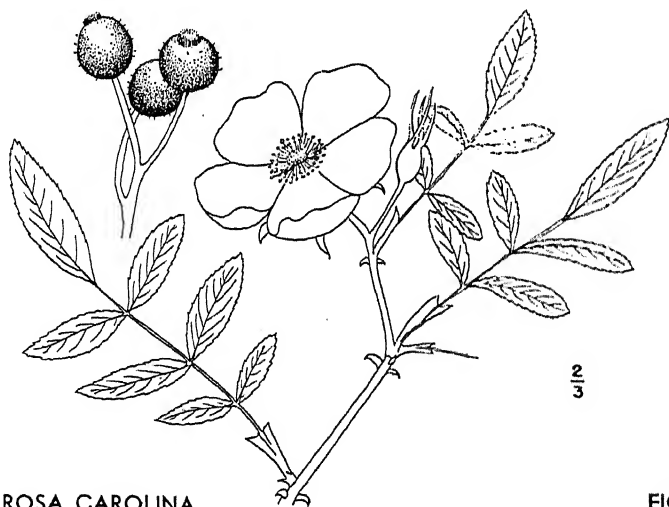
This is a most variable species consisting of several races differing in the form of the fruit and in the amount of pubescence. Several have been separated and named. The Prickly Wild Rose was first named from Siberia.

Rosa blanda Ait. (Smooth Rose, Meadow Rose). Fig. 64. Shrub with erect branched stems, 3-15 dm. high, entirely unarmed or with a few straight slender prickles; stipules broadened, naked and entire or slightly glandular-toothed; leaves alternate, deciduous 5-7 foliate, rachis with fine woolly pubescence; leaflets oval or obovate, mostly



ROSA RUBIGINOSA

FIG. 65



ROSA CAROLINA

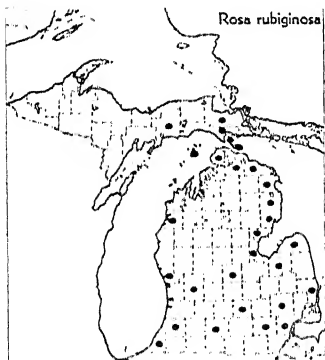
FIG. 66

pale beneath, thin, wedge-shaped at the base and short stalked, rounded at the apex, simply serrate, not resinous, the upper 2-4 cm. long, 1-2 cm. wide, the lower smaller; petiole with woolly pubescence, rarely glandular; flowers pink, few in a cluster or solitary, about 7 cm. broad; calyx-lobes acuminate, entire, hispid-pubescent, persistent and erect upon the fruit; petals obovate or obcordate, erose; stamens many; styles distinct; fruit about 1 cm. in diameter, red, subglobose, oval or somewhat pear-shaped, glabrous. Flowers, June, July; hips ripe in autumn.

In moist rocky places Newfoundland through the New England states to central New York, west to Illinois and Missouri. Michigan throughout.

As indicated by its specific name one of the characteristics of this rose is its unarmed stems. Like the other roses it shows great differentiation and several varieties have been named.

Rosa rubiginosa L. (Sweetbrier, Eglantine Rose). Fig. 65. Shrubs with slender stems 1-2 m. high or sometimes longer, greenish-brown, armed with stout hooked spines; stipules rather broad; leaves deciduous, alternate, 5-7 foliate, rachis glandular, very fragrant; leaflets broadly elliptical or obovate, rounded at the base, obtuse at the apex, doubly serrate, green and smoothish above, densely glandular-pubescent and resinous beneath; petiole prickly; flowers pink varying to white, 2-3.5 cm. in diameter, few in a cluster or solitary; pedicel prickly and glandular; calyx glandular, 5-lobed, the lobes lanceolate and usually with lateral lobes, spreading, deciduous; petals obcordate or obovate; stamens numerous; styles distinct; fruit scarlet, oval or ovoid, 1-2 cm. long, glandular. Flowers, May, June; hips ripe in the autumn.



In waste places Nova Scotia to Ontario, Kansas, Tennessee and Virginia. Michigan, frequent central and southern portion; throughout.

The Sweetbrier Rose is a native of Europe, but has been widely naturalized throughout the eastern portion of the United States and on the Pacific coast. It appears to be thoroughly at home in its adopted country and the botanist is liable to find it by the side of the road, in a thin, upland woods or in almost any waste place. It has been a particular favorite in England for hundreds of years and as the Eglantine it has been used in the poetry of Shakespeare, Spencer and Chaucer.

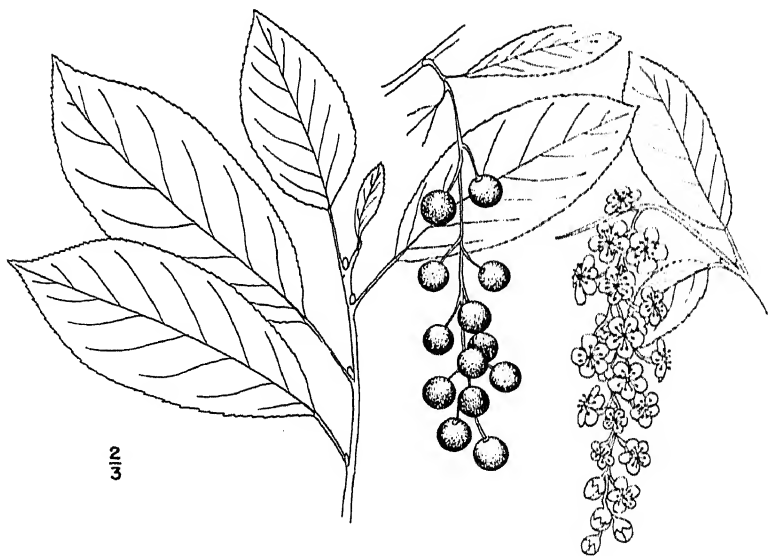
The branches are fiercely armed and it is a wicked thing to deal with. It will seize hold of the clothing and flesh of the passer-by and scratch and claw. But in spite of these characteristics it has a charm all its own. Its aromatic fragrance comes from resinous glands which thickly cover the under surface of the leaves.

Rosa carolina L. (Swamp Rose). Fig. 66. Stems erect, 3-25 dm. tall with rather distant stout, straight or recurved prickles, dull purple in age; stipules very narrow and long; leaves alternate, deciduous, 5-9 foliate, usually 7; leaflets



ROSA HUMILIS

FIG. 67



PRUNUS VIRGINIANA

FIG. 68

very variable in outline, oval, ovate, oval-lanceolate, or obovate, 1.5-3.5 cm. long, wedge-shape or rounded at the base, ovate or obtuse at the apex, finely



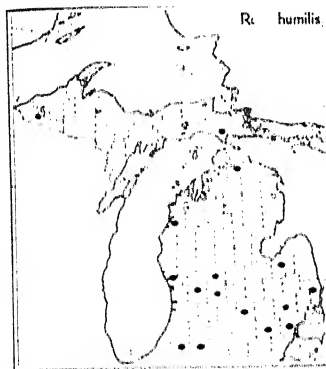
and simply serrate, mostly short-stalked, often pale or pubescent beneath; petiole often prickly; inflorescence a corymbose cluster or the flowers rarely solitary; pedicel glandular-hispid or smoothish, 1-2 cm. long; flowers bright pink, 5-7 cm. broad; calyx-lobes 5, lanceolate, acuminate or dilated above, sometimes more or less lobed, hispid-pubescent or reflexed, tardily deciduous after flowering; petals obcordate; stamens many; styles distinct; fruit scarlet, globose or depressed-globose, about 8-10 mm. high, glandular-hispid. Flowers, June, August; hips ripe in the autumn.

In swamps and low grounds Nova Scotia to Ontario, Minnesota, south to Florida,

Mississippi and Texas. Michigan, common throughout.

The Swamp Rose is one of our most abundant native roses and there is hardly a swamp or piece of low ground that does not have its quota. Its flowering season is long and as the hips cling to the stems all winter it is attractive throughout the year. It also takes kindly to cultivation and will thrive in almost any good soil.

Rosa humilis Marsh. (Pasture Rose). Fig. 67. Bushy shrub 1-10 dm. high, slender, stems greenish, usually armed with slender, straight or curved spines



just below the stipules, also more or less prickly; stipules narrow, entire; leaves deciduous, alternate, 5-7 foliate, rachis glabrate or glabrous; leaflets thin, ovate, oval or obovate, rounded or pointed at the base, sharply serrate, acute at apex, short-stalked or sessile, glabrous or pubescent beneath, upper surface glabrous, 1.2-2.5 cm. long; petiole glabrous or sparingly pubescent; flowers pink, usually few in a cluster or solitary, 5-7 cm. broad; pedicel usually glandular; calyx-lobes lanceolate, acuminate or dilated at apex, usually lobed, spreading and deciduous; petals obovate or obcordate; stamens many; styles distinct; fruit red, globose or depressed-globose, glandular-hispid, about 8-15 mm. in diameter. Flowers, May, July; hips ripe in the autumn.

In dry or rocky soil Newfoundland to Ontario, Wisconsin, Missouri, Georgia, Louisiana and Texas. Michigan, throughout; more abundant in Lower Peninsula.

This is perhaps our commonest wild rose and it may be found in dry places generally. Its delicate pink blossoms are delightfully fragrant and the hips stay



PRUNUS CUNEATA

FIG. 69



PRUNUS PUMILA

FIG. 70

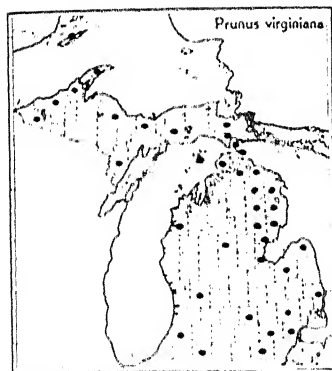
on the stems all through the winter thus prolonging its decorative qualities most of the year. In common with other roses it is extremely variable and several varieties have been separated and named.

Prunus [Tourn.] L.—PLUMS, CHERRIES, etc.

Shrubs or trees mostly with edible fruits. There are about 150 species in this genus, some 30 of which are found in North America. Of these the following coming within our classification of shrubs are found in Michigan.

1. Flowers in dense-flowered racemes; leaves mostly obovate, thin, sharply serrate with spreading teeth.....*P. virginiana*, p. 129
1. Flowers in umbellate clusters, expanding with or before the leaves
 2. Flowers small; petals mostly 4-6 mm. long; low shrubs
 3. Leaves oval, oblong or slightly obovate; petioles 8-20 mm. long.....*P. cuneata*, p. 129
 3. Leaves oblanceolate or spatulate; petioles 5-10 mm. long.....*P. pumila*, p. 131
 2. Flowers large; petals 8-16 mm. long
 4. Teeth of leaves obtusish, mostly glandular; calyx-lobes glandular-serrate, glabrous within.....*P. nigra*, p. 131
 4. Teeth of leaves acute or acuminate, bristle-tipped, not glandular; calyx-lobes entire, hairy within.....*P. americana*, p. 132

Prunus virginiana L. (Choke Cherry). Fig. 68. A tall shrub or small tree 1-4 m. high; bark gray, with numerous light colored lenticles, the inner layers

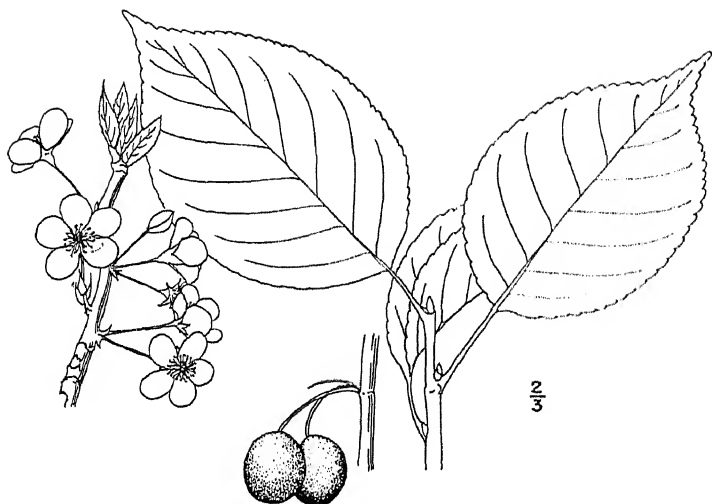


with a strong, disagreeable odor; leaves deciduous, alternate, simple, oval, oblong or obovate, 4-8 cm. long, 2-4.5 cm. wide, acute or acuminate at the apex, rounded at the base, glabrous or slightly pubescent along the veins beneath, sharply and finely serrate, thin; petiole 1-1.5 cm. long; flowers white, 8-10 mm. broad, in mainly loosely-flowered racemes terminating leafy branches of the season; calyx 5-cleft, short bell-shaped, deciduous; petals 5, obovate spreading; stamens 15-20; drupe red to nearly black, globose, 8-10 mm. in diameter, astringent; stone globose and smooth. Flowers, May; fruit ripe July, August.

Newfoundland to Manitoba and British Columbia, south to Georgia, Nebraska, Texas and Colorado. Michigan throughout.

A fairly common shrub along fence lines and edges of woods. The fruit is attractive to birds.

Prunus cuneata Raf. (Appalachian Cherry). Fig. 69. Low erect shrub 3-12 dm. high, sometimes branched and bushy, light colored, glabrous or puberulent; leaves simple, alternate, deciduous, spatulate-oblong or oblanceolate, 3-6 cm. long, 0.8-2 cm. wide, obtuse or acute at the apex, wedge-shaped at the base, more or less serrate with appressed teeth above the middle, thin, glabrous above,



PRUNUS NIGRA

FIG. 71



PRUNUS AMERICANA

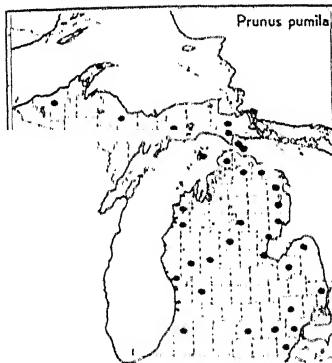
FIG. 72



pale beneath; petiole 8-20 mm. long; flowers white, 2-4 in umbels, appearing with the leaves, about 1 cm. broad; calyx 5-cleft, the lobes about 2 mm. long; petals 5, spreading; stamens 15-20; pedicels very slender, approximately 1 cm. long; drupe globose, nearly black, without bloom, about 1 cm. in diameter. Flowers, April, May; fruit ripe, August.

In thickets, wet soil, or among rocks Maine and New Hampshire to Minnesota, North Carolina and Wisconsin. Michigan, throughout, more common in the northern portion of Lower Peninsula and in the Upper Peninsula. Similar to the Sand Cherry, but grows mostly in rocky situations.

Prunus pumila L. (Sand Cherry). Fig. 70. Depressed, trailing or sometimes the stems ascending to a height of 2 meters, young shoots angled, reddish, the older stems grayish, mostly glabrous;



leaves deciduous, alternate, simple, linear-spatulate to oblanceolate, 3-7 cm. long, 1-2 cm. wide, acute or acutish at the apex, long wedge-shaped at the base, serrate or subentire above the middle, pale beneath, glabrous throughout; petiole 5-10 mm. long, generally with 1 or 2 glands; flowers white, 10-12 mm. broad, borne in lateral few-flowered sessile umbels, appearing with the leaves; calyx-lobes 5, rounded, about 2 mm. long, margins serrulate; petals 5, ovate to obovate; stamens many; pedicels 10-14 mm. long, slender; drupe globose 8-12 mm. in diameter, dark-red or dark-purple, nearly black when ripe, without bloom, flesh thin,

generally astringent. Flowers, May, June; fruit ripe last of July and August.

On sandy and gravelly shores New Brunswick to Manitoba, Maine, New Jersey, Indiana, Illinois, Michigan and westward. Michigan, chiefly bordering the Great Lakes, but also inland on the larger lakes and sandy plains.

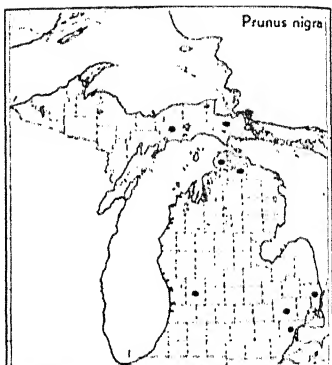
The Sand Cherry, as might be expected from its common name, grows on beaches in almost pure sand. It is also found in dryer situations, but always in sandy soil and in the open.

Prunus nigra Ait. (Wild Plum, Canada Plum). Fig. 71. Shrub or small tree, 2-7 m. high, armed with bluntish thorns; bark thin, brownish-gray; leaves deciduous, alternate, simple, oval, ovate or broadly ovate, thin, 7-13 cm. long, 3-7 cm. wide, long-acuminate at the apex, rounded or somewhat heart-shaped at the base, doubly crenate-serrate, the teeth usually gland-tipped, pubescent when young; petiole stout, 1-2 cm. long, mostly with 1 or 2 red glands near the blade; flowers white, fragrant, turning pink in age, 2.5-3 cm. broad,

borne in lateral umbels, expanding before the leaves; calyx-lobes 5, glandular-serrate, glabrous within; petals 5, broadly obovate 1.2-1.4 cm. long; stamens many, tinged with pink; pedicels 1-2 cm. long, glabrous; drupe compressed-ovoid or subglobose, orange-red or yellow, 2.5-3 cm. long, bloom little or none; stone oval, compressed or flattened, sharply ridged on one edge and grooved on the other. Flowers, May; fruit, August.

River banks and roadside thickets Newfoundland to Alberta, Massachusetts, Georgia, along the Great Lakes to Wisconsin and Iowa. Michigan, throughout, but more abundant northward.

The fruit of this wild plum is of first class quality and it makes delicious jellies and preserves.



Prunus americana Marsh. (Wild Yellow Plum, Red Plum). Fig. 72.

A shrub or small tree with a maximum height of about 7 or 8 m.; branches more or less thorny; bark dark grayish-brown, thick and rough; leaves deciduous, alternate, simple, ovate or obovate, rounded at the base, long-acuminate at the apex, 4-10 cm. long, 2-5 cm. wide, sharply and doubly serrate, the teeth not glandular, pubescent on expanding, nearly or quite glabrous when mature; petiole about 1 cm. long, with or without glands; flowers white, fragrant, 1.5-2.5 cm. broad, appearing in lateral sessile umbels before the leaves; calyx-lobes 5, entire, hairy on the inner surface; petals 5, narrowly obovate, about 1 cm. long; stamens many; pedicels 1-2 cm. long; drupe subglobose, 1.8-2.5 cm. in diameter, red or yellow, the skin tough with little or no bloom; stone somewhat flattened, one edge acute or margined, the other faintly grooved. Flowers, April, May; fruit, August, October.



River banks and borders of woods Connecticut to Manitoba, Florida, Texas and Colorado. Michigan, throughout.

This is our common wild plum. It prefers rich alluvial soil along streams, but also will be found in higher ground. It suckers freely, forming dense thickets and as "plum-brush" it is the bane of the farmer who wishes to keep his fence rows trim and neat. The fruit is pleasantly flavored and when eaten raw is very palatable. It is also much used for plum jelly and preserves.

The majority of our cultivated plums have been developed from this and the preceding species. Hedrick in 'The Plums of New York' says: "*Prunus americana* is the predominating native plum. It is the most widely distributed, is

most abundant in individual specimens and has yielded the largest number of horticultural varieties of any of the native species. . . . The species was well named by Marshall '*americana*'."

LEGUMINOSAE—PULSE FAMILY

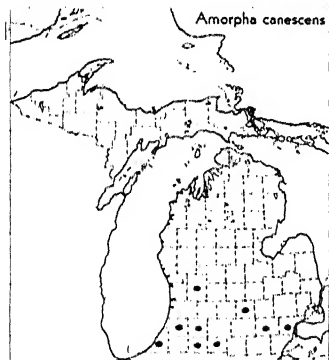
The Pulse Family consists of an immense number of species embracing herbs, shrubs, vines and trees. Michigan has several trees belonging to the family, but only one shrub. The family is divided into three subfamilies and our shrub belongs to subfamily III, the general characters of which may be summarized as follows:

Subfamily—*Papilionoideae*

Trees, shrubs or herbs; leaves alternate, deciduous, mostly compound; flowers perfect; calyx of 5 sepals, more or less united, often unequally so; corolla inserted on the base of the calyx, of 5 irregular petals, the upper or odd petal larger than the others, called the standard, the two lateral spreading, called the wings, the two lower more or less united and called the keel which enclose the stamens and pistil; stamens 10, more or less united, or occasionally distinct; ovary 1-2 celled; pistil 7, simple, 1-many-seeded, becoming a pod or legume in fruit.

Amorpha L.—FALSE INDIGOS, etc.

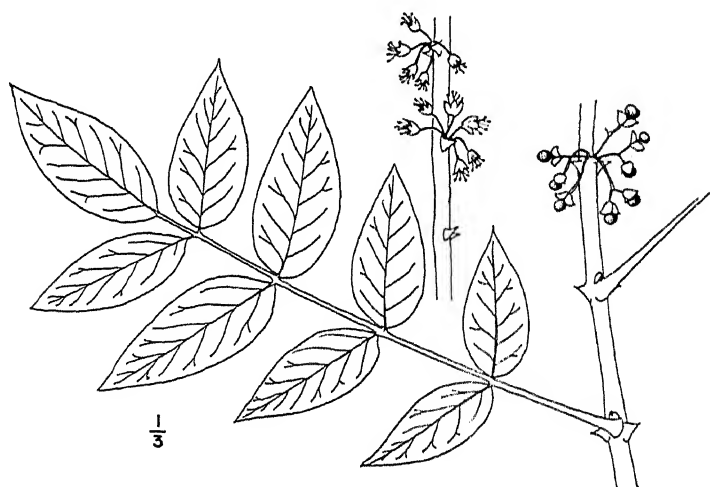
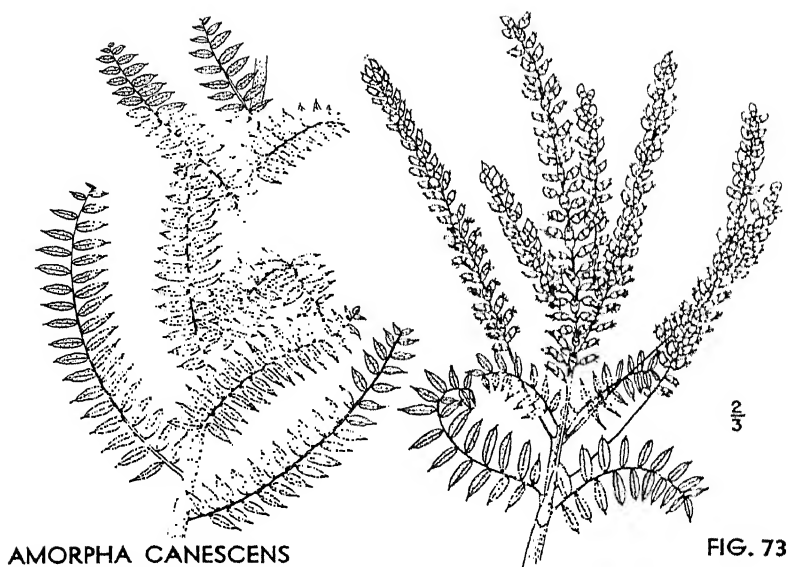
Amorpha canescens Pursh. (Lead Plant). Fig. 73. An erect shrub, 3-14 dm. high, whitened with hoary down all over; leaves alternate, deciduous, odd-pinnate, 5-10 cm. long; leaflets 21-51, short-stalked, oblong-elliptical, rounded at the base, obtuse or acutish and mucronate at the tip, 8-14 mm. long, 4-9 mm. wide, margin entire, woolly-pubescent beneath, becoming smoothish above; flowers small, purplish-blue, in dense terminal spikes; calyx 5-toothed, persistent; petals, only one, the standard, present; stamens orange-yellow; pods 1-seeded, about 4 mm. long, densely hairy. Flowers, July, August; fruit, September, October.



The Lead Plant is found on hills and prairies Indiana to Manitoba, south to Louisiana, Texas and New Mexico. Michigan, rare southern portion of Lower Peninsula.

In some sections of the west where the Lead Plant is found in abundance there has grown up the belief that it marks the existence of lead ore in the soil, probably for no other reason than that the plant is densely covered with silvery hairs and has a leaden color.

The Lead Plant continues in bloom for a long period. The deep purple spikes of flowers with their yellow stamens form a pleasing contrast with the gray foliage, and altogether it makes a valuable plant for landscape use.



RUTACEAE—RUE FAMILY

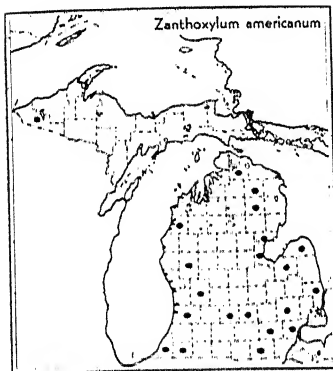
Trees or shrubs; foliage strong-scented, dotted with translucent oil glands; leaves, deciduous, alternate or opposite, mainly compound; flowers polygamodioecious, generally borne in cymes; sepals 4-5, or none; petals 3-5, free or rarely united; stamens as many as the petals and alternate with them; carpels 1-5, free or more or less united into a compound pistil; fruit a capsule or samara; seeds oblong or reniform.

Two genera containing shrubs are represented in Michigan, as follows:

Shrubs with sharp spines; leaves compound, with more than 3 leaflets.....*Zanthoxylum*
Shrubs without spines; leaves compound, with 3 leaflets.....*Ptelea*

Zanthoxylum L.—PRICKLY ASHES

Zanthoxylum americanum Mill. (Prickly Ash, Northern Prickly Ash, Toothache Tree). Fig. 74. A prickly, branched shrub, sometimes forming dense



thickets, 1.5 to 4 m. high; bark smooth, gray or brownish; branches and branchlets smooth; spines persistent, flattened at the base; leaves alternate, deciduous, pinnate; leaflets 2-4 pairs and an odd one, ovate-oblong, downy when young; flowers dioecious, small, greenish, in cymose axillary clusters, appearing before or with the leaves; sepals obsolete; petals 4-5; stamens 4-5; pistils 2-5; styles slender; fruit short-stalked, reddish-brown when mature, strongly aromatic; seeds black, shining. Flowers, April, May; fruit, August, September.

The general range of the Prickly Ash is from western Quebec to Minnesota, south to Virginia, Kentucky, Missouri and eastern Kansas. Michigan, common throughout Lower Peninsula; recorded from one county in the Upper Peninsula.

The Prickly Ash is found in rocky woods, fence rows and along river banks. A dense thicket of this prickly shrub is very difficult to negotiate and makes an effective barrier. The foliage and fruit have a pleasantly aromatic oil, but are very disagreeable to the taste. When I was a boy it was a favorite trick to persuade some uninitiated comrade to eat the berries. The result was always amusing, not, however, to the victim.

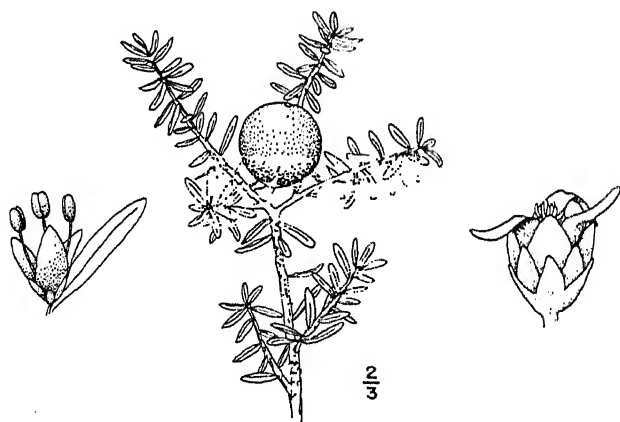
Ptelea L.—HOP TREES

Ptelea trifoliata L. (Shrubby Trefoil, Common Hop Tree, Wafer Ash). Fig. 75. A tall shrub, 1.5-5 m. high; bark smooth, gray or grayish-brown, roughened on older specimens; twigs glabrous, dark red-brown; leaves deciduous, opposite, trifoliate; leaflets nearly sessile, margins entire or serrulate, variable, obovate or lance-ovate, 5-15 cm. long, 2.5-9 cm. wide, the terminal generally somewhat larger and longer-stalked than the lateral, downy when



PTELEA TRIFOLIATA

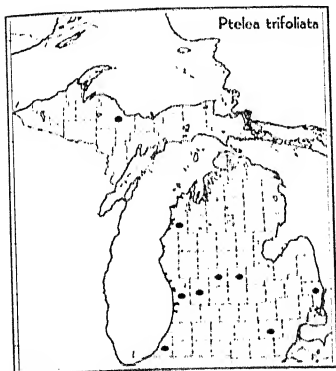
FIG. 75



EMPETRUM NIGRUM

FIG. 76

young, becoming glabrous before they are full grown, dark-green and glossy above, paler beneath with black dots on both surfaces; petioles 6-10 cm. long; flowers polygamous, small greenish-white, in terminal compound clusters; sepals 3-5; petals 3-5; stamens 3-5; fruit a 2-celled and 2-seeded samara, winged all round, nearly orbicular, 1.5-3 cm. across. Flowers, June, July; fruit ripe September, October.



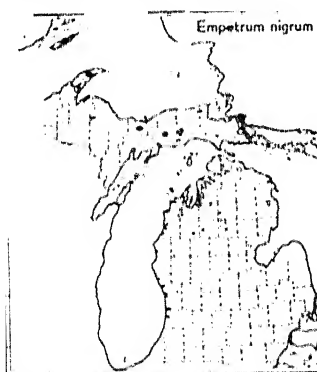
The Wafer Ash is found from New York, Connecticut and southern Ontario to Wisconsin, Kansas south to Florida and northern Mexico. Michigan, throughout, more frequent in the Lower Peninsula.

The Wafer Ash is by no means a common shrub in Michigan, but it is found in some abundance in the sand dunes along the Lake Michigan shore and occasionally in the interior. It may be used successfully as an ornamental shrub. Although its flowers are rather inconspicuous this is more than compensated for by the shining green leaves and large clusters of interesting fruits. In relation to the flowers 'Gray's Manual' states: "Odor of flowers disagreeable." To me this odor is always very pleasant. The fruit is bitter and has been used as a substitute for hops; hence one of its common names.

EMPETRACEAE—CROWBERRY FAMILY

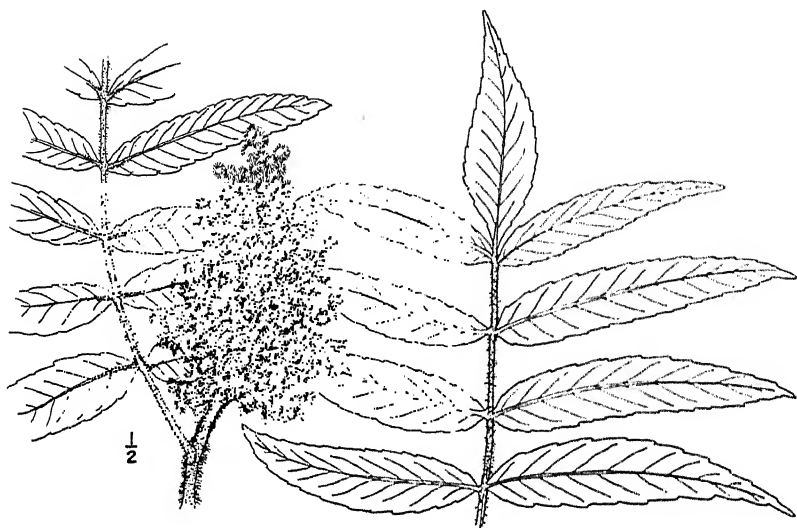
Low, shrubby, branching evergreens, heath-like in aspect; leaves sessile, narrow, small and channeled underneath by the revolute margins; flowers axillary or terminal, dioecious or monoecious, rarely perfect or polygamous; calyx of 3 sepals; petals 2-3 or none; fruit a berry-like drupe with 2-several 1-seeded nutlets.

There are three known genera in this family, one of which is represented in Michigan with one species.



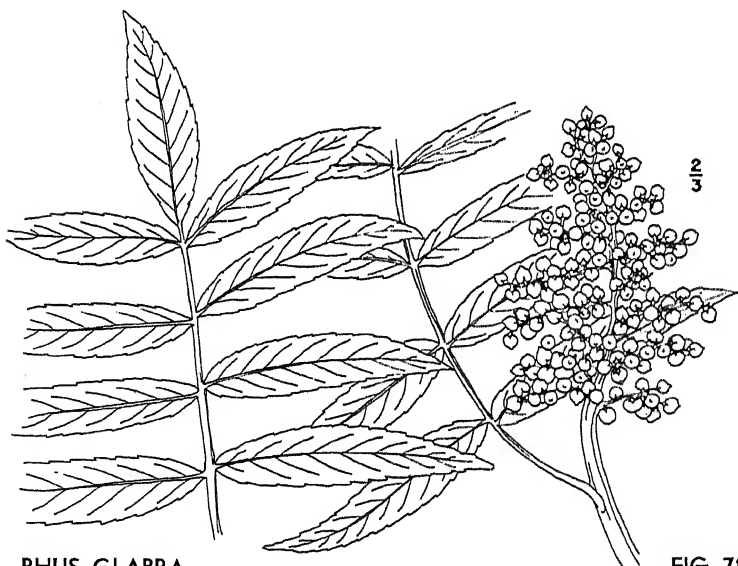
Empetrum [Tourn.] L.—CROWBERRIES

Empetrum nigrum L. (Black Crowberry). Fig. 76. A procumbent, much-branched and diffused evergreen shrub, glabrous or the young shoots pubescent; leaves simple, scattered or whorled, dark-green, thick, obtuse, 4-7 mm. long, about 1 mm. wide, the margins revolute and roughish; flowers solitary in the axils of the upper leaves, dioecious, small and inconspicuous, purplish; sepals and petals mostly 3; staminate flowers with 3 exserted stamens, the anthers turned inward; pistillate flowers with a globose 6-9 celled ovary; styles 6-9 lobed, short and



RHUS TYPHINA

FIG. 77



RHUS GLABRA

FIG. 78

thick; drupe berry-like, black or red, 4-6 mm. in diameter, containing 6-9 seed-like nutlets. Flowers, summer; fruit, fall.

In rocky places Arctic America, south to the coast of Maine, in the mountains of northern New England and New York, northern Michigan and the coast of Oregon. Michigan, Upper Peninsula, Isle Royale.

The Black Crowberry is a subarctic plant and is found in Europe and Asia as well as America. It will stand extremely low temperatures and persists where other plants will perish with the cold. The berries are not unpalatable and are eagerly eaten by the Arctic birds. I have never collected this plant, but it is recorded from Pictured Rocks on the south shore of Lake Superior and from Isle Royale.

ANACARDIACEAE—CASHEW FAMILY

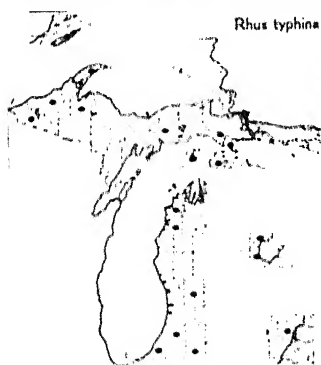
Shrubs or trees with resinous or milky, acrid juice; leaves deciduous, alternate; stipules none; flowers small, regular, perfect or polygamous, 5-parted; styles 3; fruit a small 1-seeded drupe; seed bony.

A family of about 60 genera, only the following of which is represented in Michigan.

Rhus L.—SUMACS, POISON IVIES

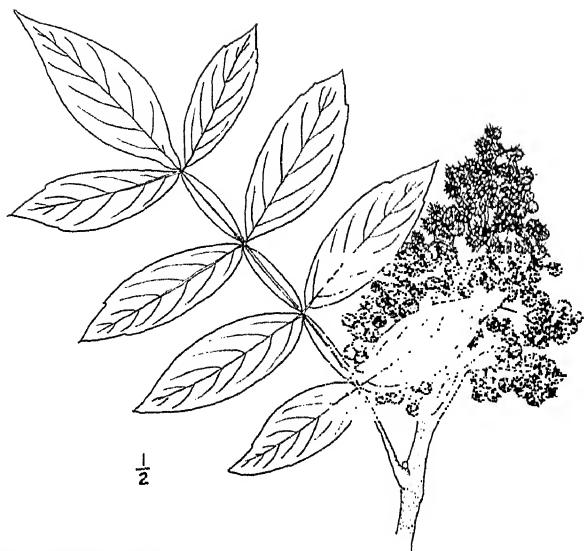
1. Leaflets regularly more than 3
 2. Twigs and petioles hairy
 3. Leaflets serrate to the base.....*R. typhina* p. 139
 3. Leaflets mostly entire, or if with a few teeth never at the base.....*R. copallina*, p. 141
 2. Twigs and petioles glabrous
 4. Leaflets serrate; fruit red.....*R. glabra*, p. 141
 4. Leaflets entire; fruit grayish-white.....*R. Vernix*, p. 141
1. Leaflets regularly 3
 5. Terminal leaflets long-stalked; flowers greenish, loosely clustered, appearing after the leaves; fruit whitish, smooth.....*R. Toxicodendron*, p. 143
 5. Terminal leaflets short-stalked; flowers yellow, in dense clusters, appearing before the leaves; fruit red, densely hairy.....*R. canadensis*, p. 144

Rhus typhina L. (Staghorn Sumac). Fig. 77. Erect shrubs or small trees, 1-6 m. high; bark gray; twigs densely velvety with long hairs; leaves alternate,



deciduous, compound, 2-6 dm. long; petioles pubescent, 4-9 cm. long; leaflets 11-31, oblong to linear-oblong, 4-14 cm. long, 1-3 cm. broad, narrowed or rounded at base, acuminate at apex, sharply and sometimes coarsely serrate, dark-green and nearly glabrous above, paler and pubescent beneath, sessile; flowers in dense terminal panicles up to 30 cm. long, yellowish-green, polygamous, 5-6 m. broad; fruit a globose drupe densely covered with long, red hairs; seed light brown, smooth. Flowers, June, July; fruit, autumn.

Dry or gravelly soil eastern Quebec to Ontario, south to Georgia and Mississippi, Indiana, Iowa and North Dakota. Michigan, common throughout.



RHUS COPALLINA

FIG. 79

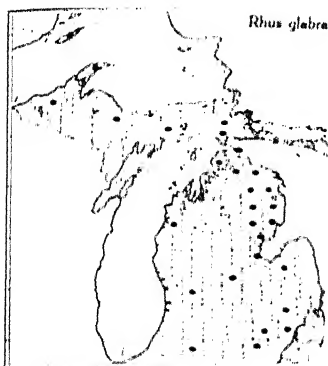


RHUS VERNIX

FIG. 80

The Staghorn Sumac is one of our commonest shrubs. It is a rapid and vigorous grower frequently used for ornamental planting where mass effects are required. The sumac is noted for its brilliant autumn coloring and the pyramidal heads of velvety-red berries are an interesting feature of our landscape.

Rhus glabra L. (Smooth Sumac). Fig. 78. Upright shrubs, 1-4 m. high; bark smooth and grayish; twigs smooth, glaucous; petioles 3-13 cm. long, some-

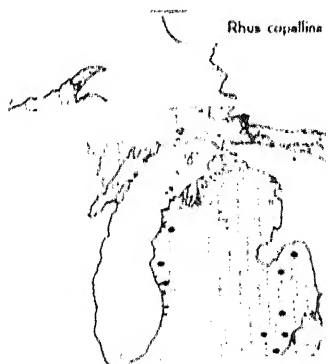


times purplish; leaves alternate, deciduous, compound; leaflets 11-31, whitened beneath, lanceolate-oblong, pointed, serrate, 6-13 cm. long, 1.5-3 cm. wide; flowers in large terminal panicles, greenish-yellow, about 5 mm. across; fruit globose, 3-4 mm. in diameter, covered with short, sticky crimson hairs, sour to the taste; seed light-brown, smooth. Flowers, June, August; fruit, autumn.

The range of the Smooth Sumac is from central Maine westward and southward. Michigan, throughout.

In Michigan the Smooth Sumac seems to be less common than the Staghorn. Like the other sumacs it is rich in tannic acid and is used for tanning leather. The leaves and berries have been used in medicine and the berries were used by the Indians as a dye. Several varieties and forms of this species have been named.

Rhus copallina L. (Dwarf Sumac, Shining Sumac). Fig. 79. Shrub 0.3-2 m. high, or higher southward; branches and stalks downy; leaves alternate, deciduous, compound, 1-3 dm. long, rachis

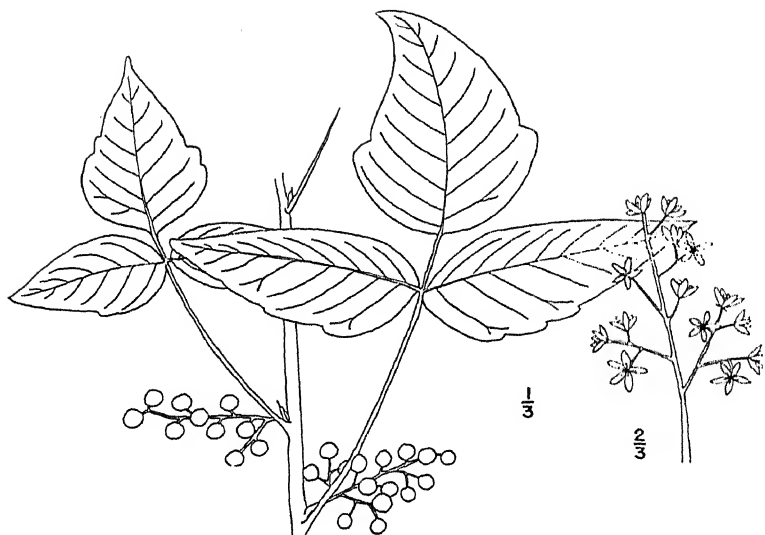


more or less winged between the 9-21 oblong or ovate-lanceolate often entire leaflets which are oblique or unequal at the base, smooth and shining above, more or less pubescent beneath; inflorescence a terminal panicle, 1-2 dm. long; flowers greenish-yellow, about 4 mm. across; fruit about 4 mm. in diameter, red, densely covered with hairs and with short-stalked glands; seeds smooth, light brown. Flowers, July, August; fruit, autumn.

Rocky, or dry sandy soil, New England, Minnesota, south to Florida and Texas. Michigan, frequent Lower Peninsula.

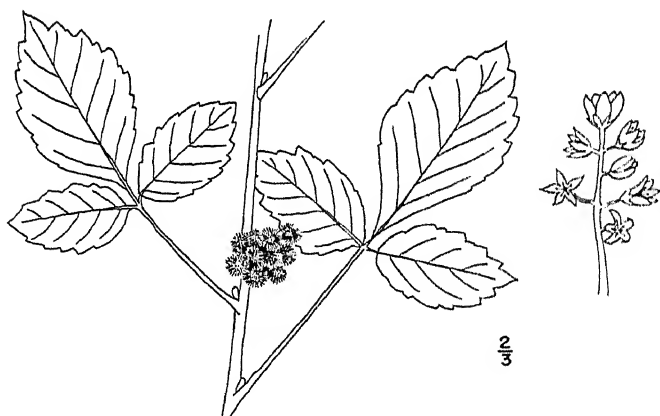
Like the others the foliage of this sumac colors beautifully in the fall.

Rhus Vernix L. (Poison Sumac, Poison Oak, Poison Dogwood, Poison Elder, Swamp Sumac). Fig. 80. Shrub 2-5 m. high; bark gray; twigs greenish, smooth; leaves alternate, deciduous, petioled, pinnate, 15-36 cm. long; leaflets 7-13, obovate-oblong, 4-11 cm. long, 2-6 cm. wide, acute or acuminate at the apex, tapering at base, nearly sessile, terminal leaflet stalked, margins entire or



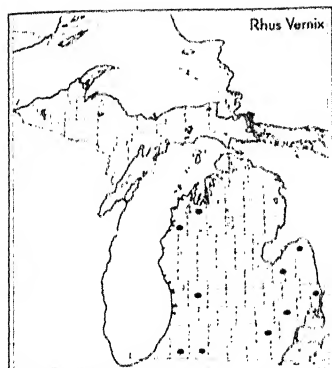
RHUS TOXICODENDRON

FIG. 81



RHUS CANADENSIS

FIG. 82



wavy, dark-green and glabrous, or slightly puberulent; flowers greenish-yellow, very small; panicles axillary, numerous, long-peduncled, drooping; fruit yellowish-green, smooth and shining, about 4 mm. in diameter. Flowers, June; fruit ripe in the autumn.

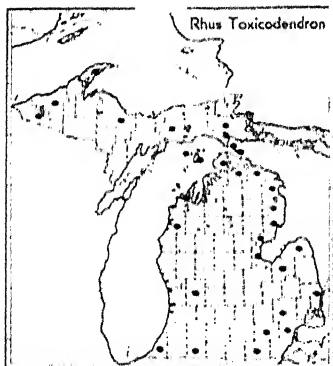
Ranges from northern New England to Minnesota and south to Florida and Texas. Michigan, common in swamps Lower Peninsula.

The Poison Sumac is our most poisonous woody plant and it is fortunate that it grows mostly in wet inaccessible swamps. It is found sometimes, however, in roadside ditches where its branches overhang the road.

Its juices are extremely poisonous to most people and although there are some who are entirely immune it is unsafe to experiment. It will be noted that the common names with one exception all refer to the poisonous qualities of the shrub and that refers to its habitat.

The foliage of the Poison Sumac colors beautifully and a swamp full of this shrub is a glorious sight after the first frost in the fall. This is amply demonstrated by the frontispiece which is reproduced from a colored photograph of a section of a swamp in Oakland County, Michigan.

Rhus Toxicodendron L. (Poison Ivy, Poison Oak, Three-leaved Ivy).
Fig. 81. A low, erect, suberect



or climbing shrub with creeping rhizomes, scrambling over fences, walls or on trees climbing by aerial rootlets to considerable heights; bark on older wood gray; twigs yellowish or brownish-green, sparingly pubescent or glabrate; leaves deciduous, alternate, pinnately 3-foliate, 1.5-3.5 dm. long; petioles 5-25 cm. long; leaflets ovate to rhombic, mostly acuminate, entire, crenate, or with a few irregular, coarse teeth, paler and with more or less pubescence beneath, the terminal much longer stalked than the lateral, very variable in size, shape, texture and pubescence; flowers polygamous, in loose, slender axillary panicles, greenish, about 4 mm. across; fruit globose, whitish or cream-colored, glabrous, shining, 5-6 mm. in diameter.

Flowers, May, June; fruit, August, September.

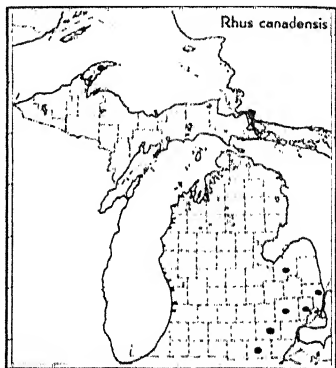
Ranges from Nova Scotia to British Columbia, south to Florida and Mexico. Michigan, common throughout.

Poison Ivy is too widely distributed and in too great abundance wherever it is growing. It will grow in almost any sort of soil, with the possible exception of peat bogs where it gives way to its close relative, *Rhus Vernix*. It has two distinct habits of growth—one climbing and the other more or less erect. The

climbing form has been separated as *R. Toxicodendron* L. var. *radicans* Torr.

The plant is very poisonous to the touch, producing an irritation known as ivy poisoning. While some are immune, or much less sensitive to the poison than others, no one should handle the plant because of supposed immunity. It should always be remembered that the compound leaves have three leaflets, rendering it easily distinguishable from the Virginia Creeper, which has five leaflets.

Rhus canadensis Marsh. (Fragrant Sumac, Aromatic Sumac). Fig. 82. Shrubs with spreading branches, or sometimes ascending 1-2.5 m. high; branchlets smooth or pubescent, brown or reddish-brown; leaves alternate, deciduous, trifoliate, 5-12 cm. long; petioles 1-3 cm. long; leaflets soft pubescent both sides when young, becoming glabrate, rhombic-obovate or ovate, unequally cut-toothed, 2.5-7.5 cm. long, the terminal one cuneate at base and sometimes 3-cleft, slightly stalked, the lateral smaller, sessile, oblique and narrowed or rounded at the base, short-acute or rounded at the apex; flowers yellow, appearing before the leaves in small solitary or clustered spikes; petals elliptic or ovate 2-2.5 mm. long; fruit a red, globose drupe, densely hairy, 6-8 mm. in diameter; seeds smooth, slightly flattened, about 4 mm. long. Flowers, March, April; fruit, July, August.



The range of *Rhus canadensis* is from Vermont to Minnesota, south to Florida and Louisiana. Michigan, infrequent throughout.

The Aromatic Sumac grows in dry, gravelly or rocky soil. Its common name derives from the scent of the crushed leaves which is not unpleasant. It is a desirable shrub for ornamental planting and will thrive in almost any dry soil.

AQUIFOLIACEAE—HOLLY FAMILY

Trees or shrubs; leaves simple, deciduous, mostly alternate; flowers small, axillary, white or greenish, mostly polygamo-dioecious; calyx minute, free from the 4-8 celled ovary; petals 4-8, separate or slightly united at the base; stamens as many as the divisions and alternate with them, attached to their base; stigmas 4-8, or united into 1, nearly sessile; fruit a small berry-like drupe enclosing 4-8 seeds.

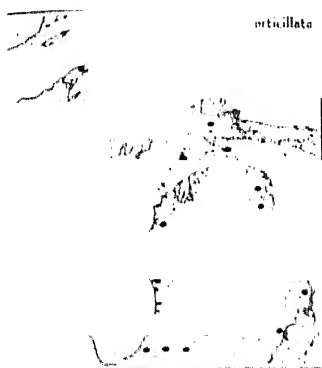
The family contains five genera and about 170 species. Two of the genera are represented in Michigan.

Leaves serrate, veins prominent; flowers on very short pedicels;
petals oval or obovate, united at base.....*Ilex*, p. 144
Leaves entire, veins inconspicuous; flowers on elongated pedicels;
petals linear, not united.....*Nemopanthus*, p. 145

Ilex L.—HOLLIES

Ilex verticillata (L.) Gray. (Winterberry, Black Alder). Fig. 83. Shrub 1-5 m. high; bark smooth, grayish; branches reddish-brown to gray; branchlets

glabrous or sometimes slightly pubescent; leaves simple, alternate, deciduous, oval, obovate, or wedge-lanceolate, pointed, acute at base, serrate, downy chiefly



on the veins beneath, 4-11 cm. long, 1.5-4 cm. wide; petioles 8-12 mm. long, channeled above, more or less pubescent; flowers mostly crowded, all on very short peduncles; calyx small, 4-6 toothed; sepals ciliate on the margins; petals 4-6, separate, or united only at base, oval or obovate, spreading or reflexed; fruit a bright red drupe, 6-7 mm. in diameter. Flowers, May, June; fruit ripe, September, October.

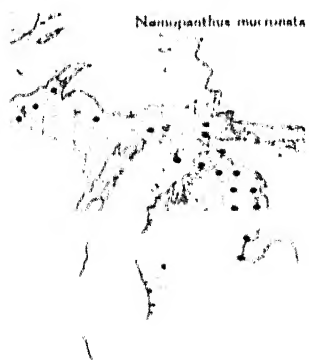
The range of this shrub is from Nova Scotia to Florida, west to Ontario, Wisconsin and Missouri where it is found in low grounds, moist woods and swamps. Michigan, frequent throughout.

At blooming time the Winterberry has little to commend it. Its flowers are comparatively inconspicuous and unattractive, but when October comes and it is clothed in scarlet berries to the very tip of its slenderest branches it comes into its own. The berries remain on the branches until mid-winter and a cluster of Winterberry shrubs in full fruit adds much gayety and beauty to an otherwise drab landscape.

Ilex is very inconstant and several varieties and forms have been named. Some are very local, but others may possibly be found in Michigan. They intergrade to such an extent, however, that it is hardly possible to separate them and they are not treated here.

Nemopanthus Raf. - MOUNTAIN HOLLIES

Nemopanthus mucronata (L.) Trel. (Mountain Holly). Fig. 84. Erect branching shrubs 1-4 m. high; bark gray; branchlets smooth; leaves alternate, simple, deciduous, entire or very rarely with a few teeth, elliptic-oblong, thin, paler beneath, 2-5 cm. long, 1-2.5 cm. wide, rounded or narrowed at the base,



blunt and mucronate at the apex, or sometimes acute, smooth on both sides; petioles 6-12 mm. long; flowers solitary or sometimes 2-4 together in the axils of the leaves, on pedicels 1-3 cm. long, very slender; calyx of 4-5 minute, mostly deciduous sepals; petals 4-5, oblong-linear, spreading, distinct; stamens 4-5, filaments slender; fruit a subglobose drupe, crimson-red, usually with 4 slightly ridged nutlets. Flowers, May; fruit ripe July, August.

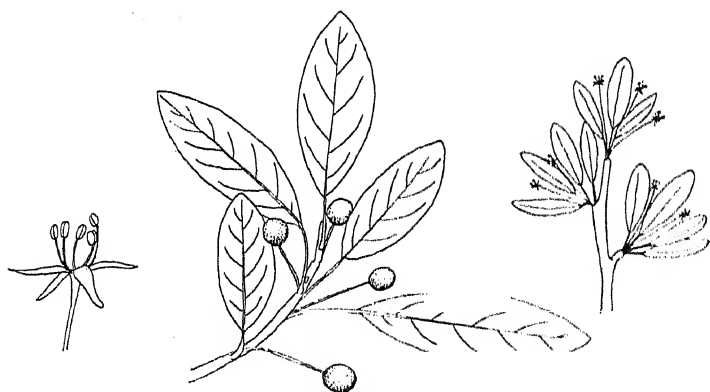
Ranges from Newfoundland to Minnesota, south to Virginia and Indiana. Michigan, frequent throughout.

The habitat of the Mountain Holly is



ILEX VERTICILLATA

FIG. 83



NEMOPANTHUS MUCRONATA

FIG. 84

given as damp cool woods, but in Michigan so far as I have observed it is found only in deep cedar and tamarack bogs where it is associated with poison sumac, high bush blueberries and other bog plants.

CELASTRACEAE—STAFF TREE FAMILY

Shrubs or climbing vines; leaves simple, alternate or opposite, deciduous; flowers small, regular, in axillary cymes or racemes; sepals 4-5 more or less united; petals 4-5; stamens as many as the petals and alternate with them, borne on a fleshy disk, which fills the bottom of the calyx and sometimes covers the 3-5 celled ovary; fruit fleshy, dehiscent; seeds with arils.

The family comprises about 40 genera and 350 species. Following are the two genera found in Michigan.

Erect or decumbent shrubs; leaves opposite.....*Evonymus*, p. 147
Shrubby climber; leaves alternate.....*Celastrus*, p. 149

Evonymus [Tourn.] L.—SPINDLE TREES

1. Capsule smooth; high shrub; leaves distinctly petioled.....*E. atropurpureus*, p. 147
1. Capsule tuberculate; low shrubs; leaves subsessile
 2. Erect or ascending shrubs; leaves ovate-lanceolate, acuminate...*E. americanus*, p. 147
 2. Decumbent shrubs; rooting at the nodes; leaves obovate, obtuse...*E. obovatus*, p. 149

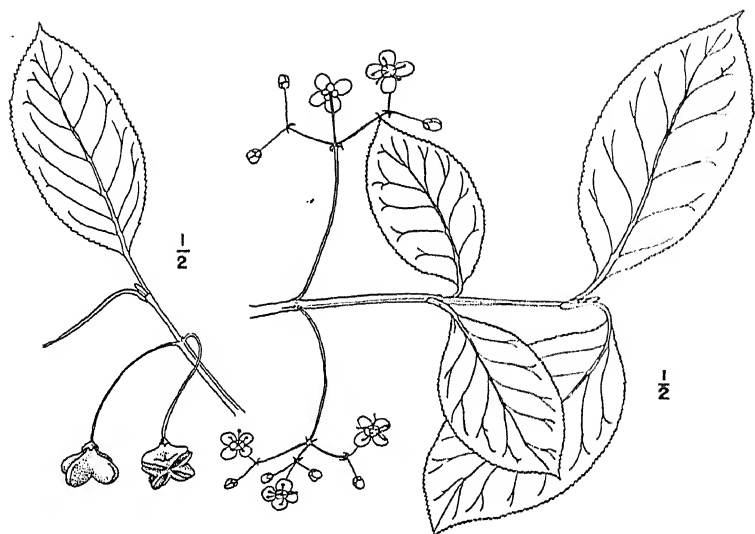
Evonymus atropurpureus Jacq. (Burning Bush, Wahoo). Fig. 85. A tree-like shrub up to 4 m. high; bark grayish-green; twigs four-sided, green, glabrous; leaves opposite, simple, deciduous, thin, ovate-lanceolate, acuminate, 5-13 cm. long, 1-4 cm. wide, narrowed or rounded at the base, glabrous above, pubescent beneath, particularly along the nerves; petioles 5-18 mm. long; flowers perfect, dark-purple, commonly in fours, 6-8 mm. in diameter, borne in branching cymes of 5-15 flowers; peduncles slender, 1.5-4 cm. long; petals broadly ovate, 2-2.5 mm. long, spreading; style short, conical; fruit a smooth, deeply-lobed capsule, pink when ripe in the fall; aril scarlet; seeds light brown, about 7 mm. long. Flowers, June; fruit, September.



Ranges from New York to Wisconsin, Nebraska southward to Florida and Texas where it is found principally along streams and in alluvial soil. Michigan, infrequent central and southern portion of Lower Peninsula.

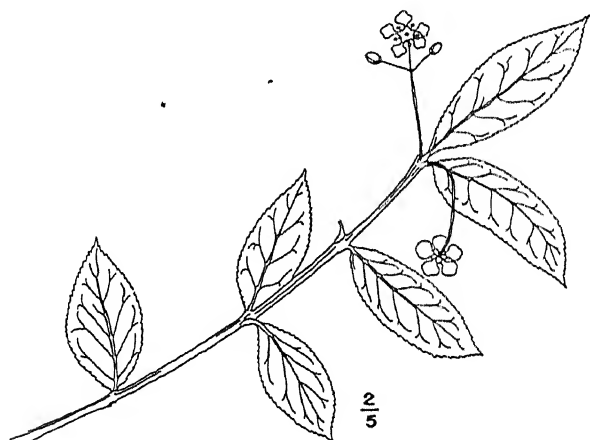
The Burning Bush is also cultivated extensively as an ornamental shrub and is entirely worthy of such treatment.

Evonymus americanus L. (Strawberry Bush). Fig. 86. Erect or ascending straggling shrub 1-2 m. high; branches and branchlets greenish, four-sided, glabrous; leaves opposite, simple, deciduous, almost sessile, thickish, bright



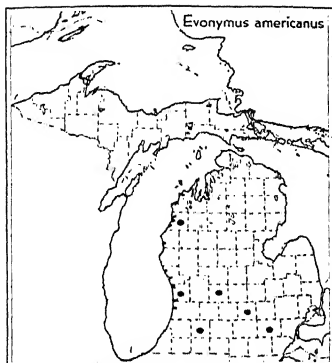
EVONYMUS ATROPURPUREUS

FIG. 85



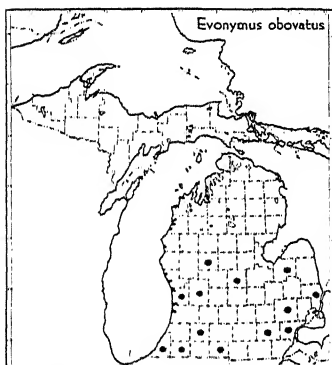
EVONYMUS AMERICANUS

FIG. 86



The Strawberry Bush is a very attractive shrub in fruit.

Evonymus obovatus Nutt. (Running Strawberry Bush). Fig. 87. Trailing shrub with rooting branches, usually not rising more than 2-3 dm. from the ground; branches green, 4-sided, or some-



what winged, glabrous or rarely pubescent; leaves simple, opposite, deciduous, 3-9 cm. long and 1.5-4 cm. wide, obovate or oblong, wedge-shaped at base, obtuse at apex, crenulate-serrate, glabrous both sides, or sometimes pubescent on the veins, thin, dull-green above, paler beneath; flowers perfect, 1-3 on a long-peduncled cyme, greenish-yellow, about 6-7 mm. across; petals 5, orbicular, without distinct claw; fruit a rough-warty capsule orange-red, generally 3-celled; seeds, 1-2.5 mm. long; aril scarlet. Flowers, April, May; fruit, September.

Wooded river banks and low woods from New York to Illinois, Florida and Texas. Michigan, common central and southern portion of Lower Peninsula.

low or wet places. Michigan, frequent southern portion of Lower Peninsula.

The Running Strawberry Bush makes an attractive vine in cultivation for covering shaded ground.

Distributed from Ontario to Pennsylvania, Kentucky and Illinois, where it is found in

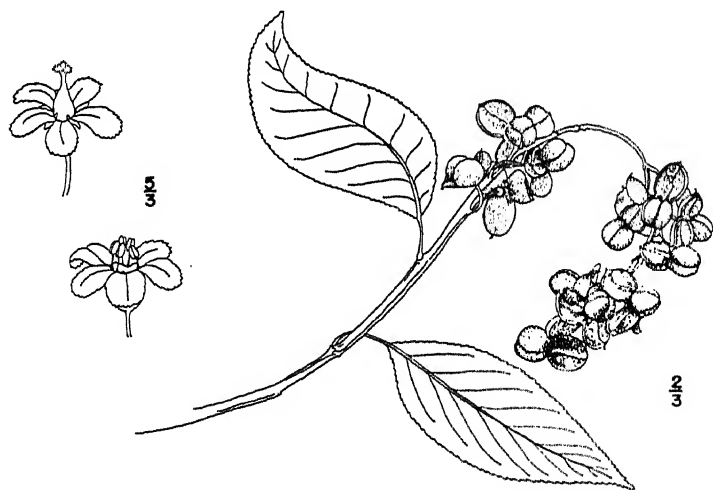
Celastrus L.—SHRUBBY BITTERSWEET

Celastrus scandens L. (Waxwork, Climbing Bittersweet). Fig. 88. A twining shrub, climbing trees to a height of 8-10 m. or more, and developing trunks up to 13 cm. in circumference, or growing on fences or trailing on the ground without support; bark gray or brownish, smooth; leaves simple, alternate, deciduous, ovate-oblong, finely serrate, pointed, narrowed or sometimes rounded at the base, 5-10 cm. long, 3-5 cm. wide, glabrous both sides; petioles 5-15 mm. long; flowers polygamo-dioecious, greenish-yellow, in terminal raceme-like clusters, 8-9 mm. broad; sepals short; petals crenulate, 3-4 mm. long; fruit



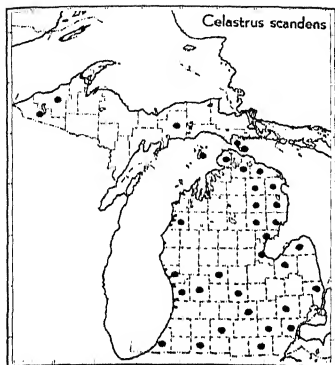
EVONYMUS OBOVATUS

FIG. 87



CELASTRUS SCANDENS

FIG. 88



bitersweet is probably our best-known and most-loved native shrub.

a globose capsule maturing in the fall, about 10-12 mm. in diameter, orange-colored, displaying the scarlet covering of the seeds, which are reddish-brown and about 5 mm. long. Flowers, June; fruit ripe September, October.

Distributed from Maine to Manitoba and southward. Michigan, common throughout.

The natural habitat of the Climbing Bittersweet is along streams and in thickets, but it also seems to thrive in sandy situations. It is extensively planted as an ornamental vine and always gives a good accounting of itself. It is easily propagated by any of the well-known horticultural methods. The Bit-

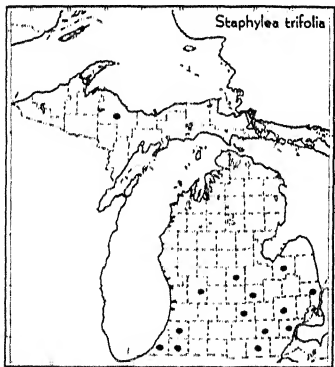
STAPHYLEACEAE—BLADDER NUT FAMILY

Shrubs or small trees with opposite, deciduous, odd-pinnate or 3-foliate stipulate leaves; flowers perfect, in terminal or axillary clusters; sepals, petals and stamens usually 5; carpels 3; stamens alternate with the petals, borne outside a large disk; fruit a bladdery capsule; seeds solitary or few in each cavity of the ovary.

The family contains about 5 genera and 22 species, of which the following is found in Michigan.

Staphylea L.—BLADDER NUTS

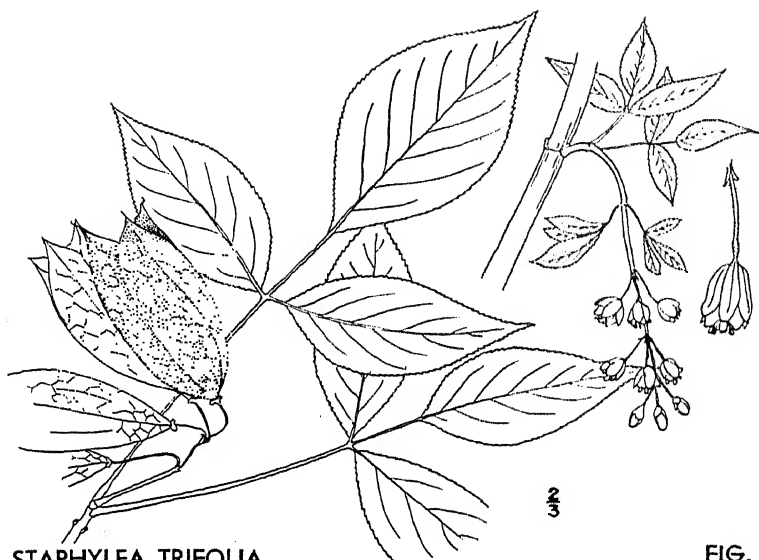
Staphylea trifolia L. (American Bladder Nut). Fig. 89. Erect shrubs, 1-4 m. high; bark grayish; branches greenish-striped, glabrous; leaves opposite, deciduous, trifoliate; petioles 2.5-12 cm. long; leaflets ovate to obovate, 4-10 cm. long, 2-6 cm. wide, the terminal somewhat larger than the lateral, narrowed or rounded at the base, short-acuminate at the apex, margin closely serrate, smooth above, pubescent, at least along the veins beneath; flowers about 1 cm. long, in racemes 3-6 cm. long, corolla white; fruit an inflated pod with three cells, 2-3 cm. in diameter, up to 8 cm. long; seeds 1-3, light brown, smooth, about 6 mm. long, 5 mm. wide. Flowers, April, May; fruit, September.



The American Bladder Nut grows in thickets in moist soil from Quebec south to South Carolina, west to Minnesota and

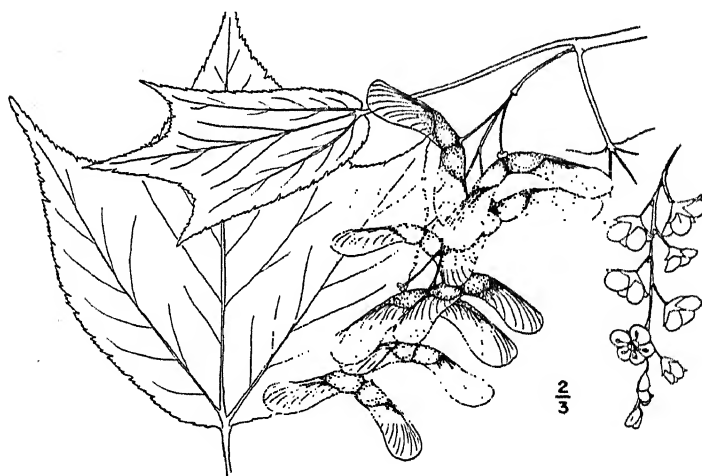
Kansas. Michigan, throughout, more frequent in the Lower Peninsula.

The interesting fruits of the Bladder Nut make it a desirable shrub for ornamental planting.



STAPHYLEA TRIFOLIA

FIG. 89



ACER PENNSYLVANICUM

FIG. 90

ACERACEAE—MAPLE FAMILY

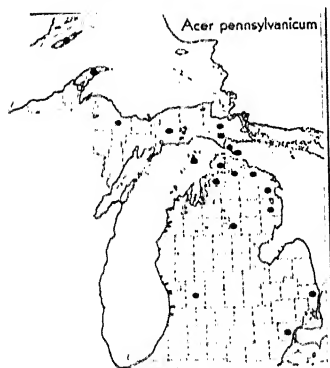
Trees and shrubs with watery, sugary sap; leaves deciduous, opposite, simple and palmately lobed or more rarely palmately or pinnately divided; flowers regular, mostly polygamous or dioecious, sometimes apetalous; ovary 2-celled, 2-lobed; styles 2; fruit 2 long-winged samaras united at the base, each 1-seeded.

This family embraces two genera, one of which, the maples, is represented in Michigan.

Acer [Tourn.] L.—MAPLES

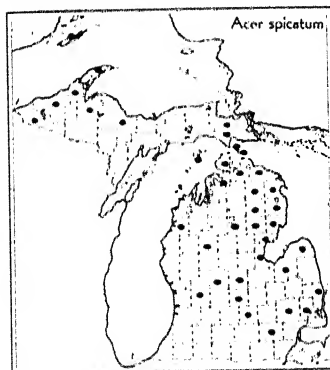
Racemes drooping; leaves finely serrate.....*A. pennsylvanicum*
 Racemes erect; leaves coarsely serrate.....*A. spicatum*

Acer pennsylvanicum L. (Striped Maple, Moosewood). Fig. 90. A small tree or large shrub; bark light-green, striped with dark lines; leaves opposite, simple, deciduous, 1.5-2 dm. long, 3-lobed at the apex, finely and sharply double-serrate, the short lobes taper-pointed and serrate, rounded or cordate at the base, glabrous, yellowish-green above, paler beneath; flowers greenish-yellow in loose, drooping terminal racemes 7.5-10 cm. long, appearing after the leaves; calyx 5-parted; petals 5, obovate; stamens 6-8; fruit glabrous with large divergent wings. Flowers, May, June; fruit ripening late summer, autumn.



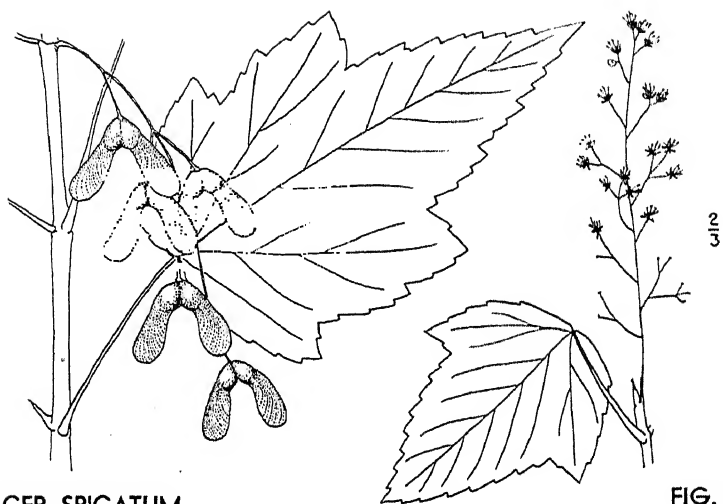
The Striped Maple is found in rich, cool woods from Quebec to western Ontario, south to New England, New York, the Great Lakes region and in the mountains to Georgia. Michigan, throughout, except the extreme southern tier of counties; more abundant northward.

This maple is on the border line between the trees and shrubs; Otis includes it in his list of the trees of Michigan. He says: "Habit—a small tree at best, more often a large shrub." This furnishes the excuse for including it among the shrubs of Michigan.



The common name, Moosewood, which this species bears indicates that it is browsed by the moose. It is also a great favorite of the deer and where these animals range the undergrowth of striped maple is inevitably browsed.

Acer spicatum Lam. (Mountain Maple). Fig. 91. A shrub 2-4 m. high, or rarely a bushy tree; bark greenish, smooth or somewhat furrowed; leaves simple, deciduous, opposite, 3-lobed, 6-12 cm. long, 5-10 cm.



ACER SPICATUM

FIG. 91



RHAMNUS ALNIFOLIA

FIG. 92

wide, coarsely crenate-serrate with pointed teeth, cordate at base, lobes acute or taper pointed, thin, glabrous, dark-green above, whitish-pubescent beneath; petioles 3-10 cm. long; flowers, after the leaves are full grown, small, greenish-yellow, borne in erect terminal racemes, 7-10 cm. long; calyx 5-lobed; petals 5; stamens 7-8; samaras somewhat divergent, 1.8-2 cm. long, bright red, glabrous. Flowers, May, June; fruit, ripening in July.

Found in moist woods Newfoundland and Labrador to Hudson Bay and Manitoba south to New England, New York, the Great Lakes region, eastern Iowa and in the mountains to Georgia. Michigan, throughout both peninsulas.

The Mountain Maple always grows in the shade of other trees. Like various typically northern plants it has found a congenial habitat in the deep bogs of our southern counties where it grows in considerable abundance.

RHAMNACEAE—BUCKTHORN FAMILY

Shrubs or small trees; leaves simple, deciduous, mostly alternate; flowers small and regular, in axillary or terminal cymes or racemes, perfect or polygamous; calyx 4-5 toothed; petals 4-5, inserted on the calyx, or none; stamens 4-5, inserted with the petals and opposite them; ovary 2-5 celled; fruit a drupe or capsule mostly 3-celled; seeds 1 in each cell.

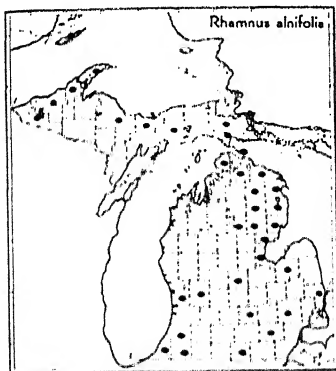
Two genera of this family are represented in Michigan.

Fruit a drupe; flowers greenish-yellow; calyx and disk free from the ovary...*Rhamnus*, p. 155
Fruit a dry capsule; flowers white; calyx and disk adherent

to the base of the ovary.....*Ceanothus*, p. 157

Rhamnus [Tourn.] L.—BUCKTHORNS

Rhamnus alnifolia L'Her. (Alder Buckthorn, Dwarf Alder). Fig. 92.
A low shrub, up to 1 m. in height, without thorns; bark reddish-brown, smooth; twigs puberulent; leaves simple, alternate, deciduous, ovate to obovate, 4-10 cm. long, 2-5 cm. wide, acute or acuminate at the apex, rounded or narrowed at the base, crenate-serrate, glabrous above, puberulent along the veins beneath; petioles 4-10 mm. long; flowers usually dioecious, from the axils of the lower leaves and appearing with them, green, small, about 3 mm. across; sepals 5; petals none; pedicels slender, 1-8 mm. long; fruit a black, ovoid or globose drupe, about 6 mm. in diameter; nutlets 3, deeply grooved on the back. Flowers, May, June; fruit, August, September.



Tamarack swamps, cedar bogs from Newfoundland to British Columbia, south to New Jersey, Pennsylvania, Illinois, Nebraska and Wyoming. Michigan, common throughout.

While this shrub is a native of the swamps, it takes kindly to cultivation and is sometimes used as a border shrub in landscaping. The small yellow flowers are inconspicuous, the black fruit is not attractive and altogether this is probably the least useful of our shrubs.



CEANOTHUS AMERICANUS

FIG. 93



CEANOTHUS OVATUS

FIG. 94

Ceanothus L.—RED-ROOTS

Leaves ovate, or ovate-oblong, pubescent; seeds smooth.....*C. americanus*
 Leaves oblong, narrowly oval or elliptic-lanceolate,
 glabrous or nearly so; seeds pitted.....*C. ovatus*

Ceanothus americanus L. (New Jersey Tea, Red-root). Fig. 93. Branching shrubs less than a meter high with several stems from the deep, reddish,



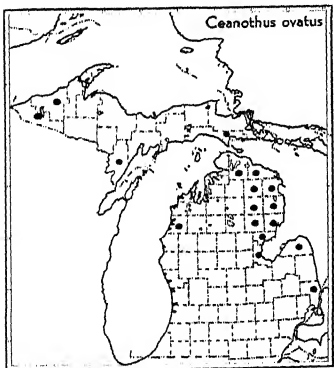
root stem; grayish or reddish-brown, somewhat downy-pubescent above, glabrous below; leaves alternate, simple, deciduous, ovate or ovate-oblong, 2.5-7.5 cm. long, 1-2.5 cm. broad, acutish to acuminate at the apex, obtuse or subcordate at the base, serrate, strongly 3-ribbed, more or less pubescent; petioles 6-12 mm. long; flowers in dense clusters at the ends of long axillary or terminal peduncles, white, small; calyx 5-lobed, incurved; petals 5, clawed, hooded, longer than the calyx-lobes, attached under the disk; stamens 5, filaments elongated; pedicels glabrous, 4-5 cm. long; fruit a 3-celled capsule, about 3 mm. long, one seed in each cell; nutlets 2.5-2 mm. long, light-

brown, smooth. Flowers, July; fruit ripe September, October.

In dry open woods, along roadsides and gravelly shores Maine and Ontario to Manitoba, Kansas, Florida and Texas. Michigan, frequent throughout.

According to tradition the leaves of this shrub were used as a substitute for tea during the Revolutionary War. The clusters of delicate white flowers are very attractive.

Ceanothus ovatus Desf. (Smaller Red-root, Inland Jersey Tea). Fig. 94. Erect shrubs 3-6 dm. high, much branched, nearly glabrous throughout; leaves simple, alternate, deciduous, oblong, narrowly oval or elliptic-lanceolate, 1.5-6



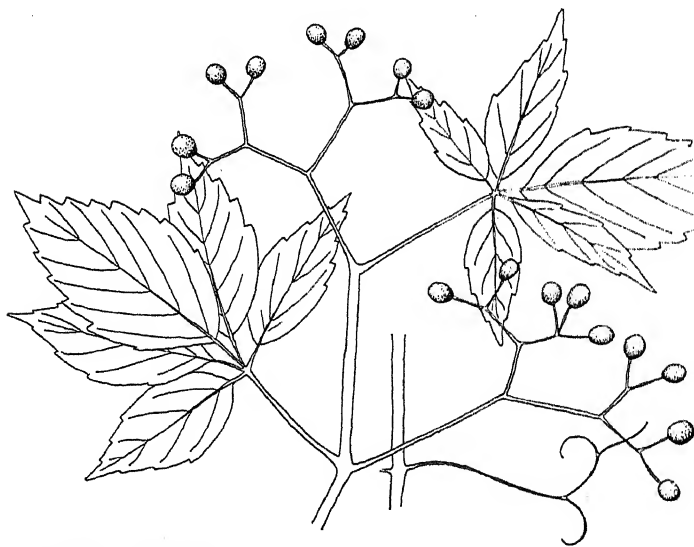
cm. long, 1.2-5 cm. wide, obtuse or rounded at the apex, narrowed at the base, finely and sharply glandular-serrate, glabrous beneath, or slightly pubescent along the veins; petioles about 5 mm. long; flowers on short peduncles, white, about 5 mm. broad; pedicels 10-15 mm. long; fruit globose, slightly flattened at the top; seeds dark-brown, about 2 mm. in length, surface pitted. Flowers, June, July; fruit, September, October.

In dry rocky or sandy soil from Vermont and eastern Massachusetts to Manitoba, Minnesota, Illinois and southwestward. Michigan, upper portion of Lower Peninsula and the Upper Peninsula.



PSEDERA QUINQUEFOLIA

FIG. 95



PSEDERA VITACEA

FIG. 96

This species has a variety, *pubescens* T.&G., with permanently sordid-tomentose leaves which has a more western and southern range. It has been collected in Keweenaw County and might be looked for in other localities.

VITACEAE—VINE FAMILY

Climbing or erect shrubs with watery, acid juice and nodose joints; leaves deciduous, alternate, simple, palmately veined or lobed, or compound; tendrils and flower-clusters opposite the leaves; stipules deciduous; flowers small, regular, greenish, commonly polygamous, borne in racemes, panicles or cymes; calyx entire or 4-5 lobed; petals 4-5, separate or coherent, valvate, very deciduous; stamens as many as the petals and opposite them; filaments slender; style short or none; stigma slightly 2-lobed; ovary 2-celled generally immersed in the disk; ovules 1 or 2 in each cell; fruit a 2-celled berry; seeds usually 4, with a bony coat.

Two genera including shrubs belonging to this family are found in Michigan.

Leaves palmately compound, corolla expanding.....*Psedera*, p. 159

Leaves simple, corolla falling without expanding.....*Vitis*, p. 161

Psedera Neck.—VIRGINIA CREEPERS

Leaflets with upper surface dull and much paler beneath; tendrils mostly with adhesive disks, 5-12 branched.....*P. quinquefolia*, p. 159

Leaflets with upper surface shining and not much paler beneath; tendrils mostly without adhesive disks, 2-5 branched.....*P. vitacea*, p. 161

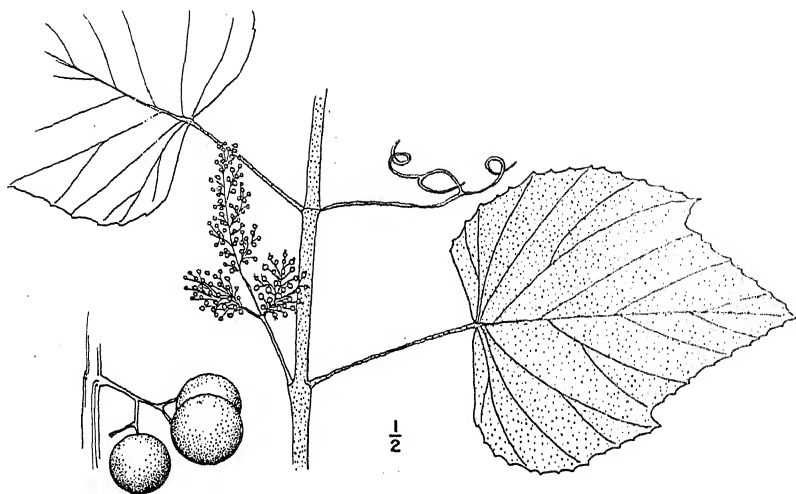
Psedera quinquefolia (L.) Greene. (Virginia Creeper, Woodbine). Fig. 95. High-climbing or trailing woody vines; stem sometimes reaching a diameter of 3-6 cm.; tendrils with 5-12 branches, mostly ending with adhesive disks; leaves deciduous, alternate, petioled, usually 5-foliate; leaflets stalked, ovate, oblong-ovate or obovate, 4-12 cm. long, 2-6 cm. wide, acute or acuminate, narrowed at base, coarsely serrate, dull-green above, decidedly paler beneath, glabrous or pubescent; panicles with branches 6-12 cm. long, loose, erect or spreading in fruit; flowers small, greenish, about 6 mm. broad; petals 5, spreading; stamens 5; style short, thick; berry subglobose, blue-black, 5-8 mm. in diameter; pedicels about 5 mm. long, red; seeds 1-4, resembling those of the grape in size and color. Flowers, June, July; fruit ripe September,



October.

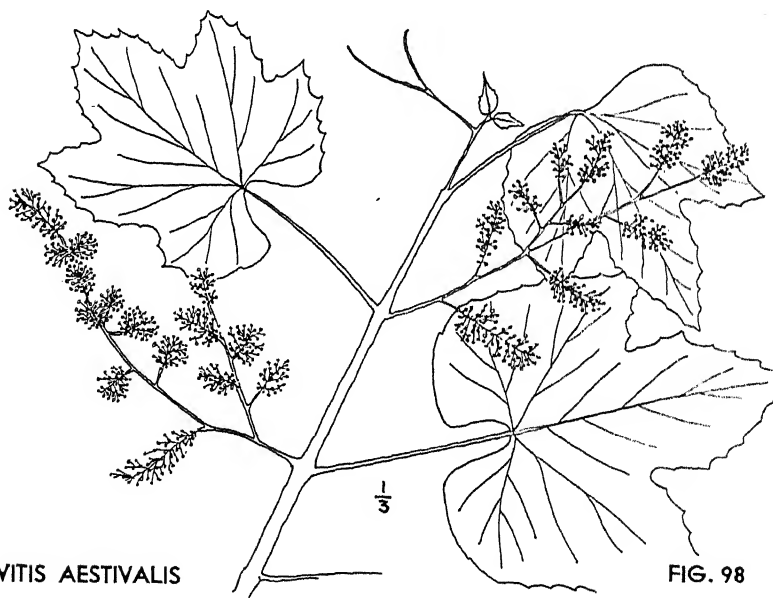
In woods and thickets New England, westward to Missouri, south to Florida, Texas and Mexico; very common. Michigan, throughout.

This plant, often called the Five-fingered Ivy, is one of our most common vines. Its leaves are brilliantly colored in the fall, and it is used extensively in landscape work as a covering for fences, trellises, etc. The three-leaved poison



VITIS LABRUSCA

FIG. 97

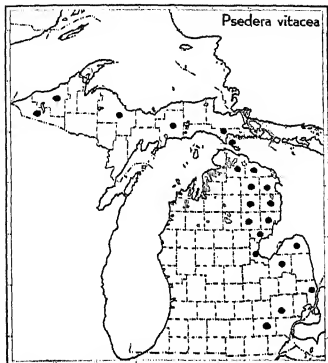


VITIS AESTIVALIS

FIG. 98

ivy is often confused with this plant. The species is extremely variable in pubescence and size of leaves. Two varieties have been separated and named, but as they apparently completely intergrade they are not given here.

Psedera vitacea (Kner) Greene. (False Grape). Fig. 96. Woody climbing or trailing vines up to several meters in length; glabrous or sparingly pubescent; tendrils with 2-5 long-twining branches, these only very rarely ending in adhesive disks; aerial rootlets none; leaves deciduous, alternate, petioled, normally 5-foliate; leaflets stalked, ovate, oblong-ovate, 4-13 cm. long, 2-8 cm. wide, deep-green, thin, somewhat shining above, not much paler beneath, glabrous or somewhat hairy; petioles long, glabrous; inflorescence regularly dichotomous, the primary branches nearly equal; peduncles 4-8 cm. long; flowers about 5 mm. in diameter, greenish; calyx small, not divided; petals 5, spreading or reflexed; stamens 5; style short, thick; berry somewhat obovoid, 6-10 mm. in diameter, fleshy, blue-black; seeds 1-4, 4-5 mm. long and resembling those of



the grape in size and color. Flowers, June, July; fruit ripe September, October.

Moist woods, alluvial thickets Quebec to Manitoba south to Pennsylvania, Arizona and Texas. Michigan throughout.

This is similar to the preceding species and grows in like situations. The more shining leaves and tendrils without adhesive disks are distinguishing marks which can be readily recognized. Its leaves are brilliantly colored in the fall.

Vitis [Tourn.] L.—GRAPES

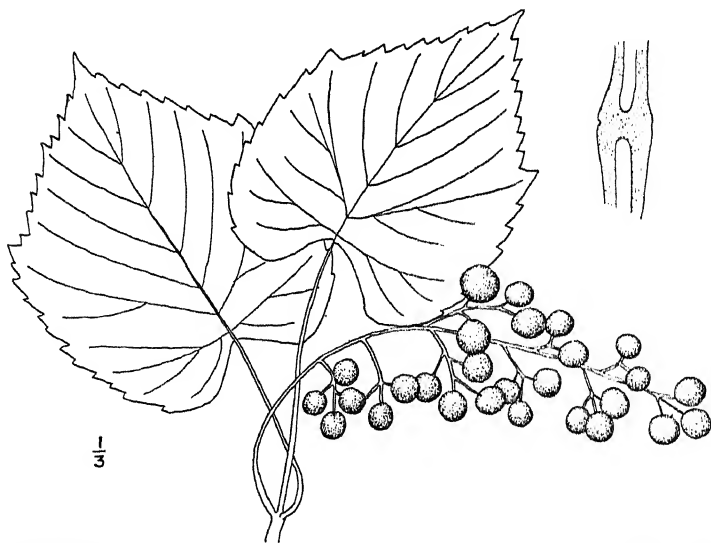
1. Lower surface of leaves velvety-tomentose
 2. Berries large; a tendril or inflorescence opposite each leaf.....*V. labrusca*, p. 161
 2. Berries smaller; no tendril opposite each third leaf
 3. Branchlets, petioles and lower surface of leaves covered with a generally rusty pubescence.....*V. aestivalis*, p. 163
 3. Branchlets, even when young mostly glabrous; lower surface of leaves very pale and glaucous, becoming nearly smooth.....*V. bicolor*, p. 163
1. Lower surface of leaves nearly glabrous, or pubescent along the veins and in their axils
 4. Teeth of leaves broadly deltoid, tipped with a sharp point; berries small, black and shining, sour.....*V. cordifolia*, p. 165
 4. Teeth of leaves narrowly deltoid or lanceolate; berries blue with a bloom.....*V. vulpina*, p. 165

Vitis labrusca L. (Northern Fox Grape). Fig. 97. Long-climbing or trailing vines; bark loose and shreddy; branchlets very woolly; leaves deciduous, alternate, simple, entire or deeply lobed, slightly dentate, with rounded sinuses, cordate, 4-12 cm. long, 5-14 cm. wide, very woolly and mostly red or rusty when young, becoming dark-green and glabrous or nearly so above at maturity,



VITIS BICOLOR

FIG. 99



VITIS CORDIFOLIA

FIG. 100

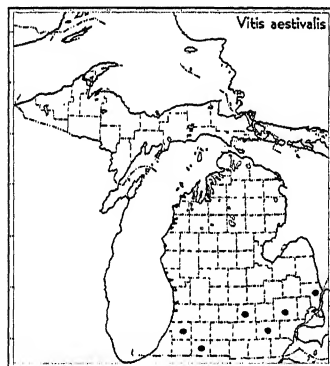


continuing tawny or rusty-pubescent beneath; petioles 5-10 cm. long, rusty-pubescent; fertile panicles compact, the staminate looser; flowers yellowish-green, fragrant, polygamodioecious; calyx very short; petals deciduous without expanding; style short; berries few, large, brownish-purple or amber color with a tough musky pulp; seeds 3-6, about 8 mm. long. Flowers, May, June; fruit ripe August, September.

Moist or dry thickets from New England states to Indiana and south to Georgia. Michigan, distribution confined to the southern portion of the Lower Peninsula.

The Northern Fox Grape is the species from which has been developed through cultivation several of our garden and vineyard grapes among which the Concord is the most prominent.

Vitis aestivalis Michx. (Summer Grape, Pigeon Grape). Fig. 98. High-climbing vines; bark loose and shreddy; branches terete, more or less pubescent

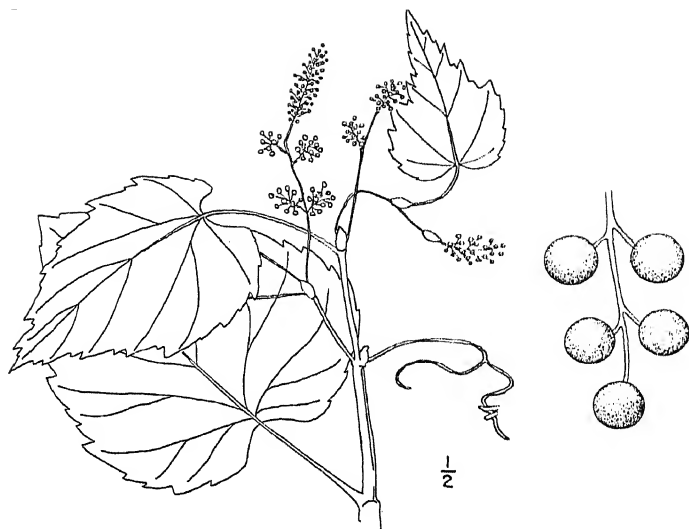


when young, becoming glabrate; pith interrupted at nodes; leaves simple, deciduous, alternate, large, unlobed or more or less deeply and obtusely 3-5 lobed, dentate, 5-17 cm. long and about as broad, very woolly with whitish or rusty pubescence, particularly when young, sometimes becoming nearly glabrous and bright green above in maturity, remaining more or less pubescent beneath; petioles pubescent, mostly shorter than the leaves, but sometimes longer; inflorescence generally long and loose; berries numerous, about 8-10 mm. in diameter, black with a bloom, edible; seeds 2-3, about 5-6 mm. long. Flowers May, June; fruit ripe September and October.

In thickets southern New Hampshire to Florida, west to Kansas and Texas. Michigan, distribution confined to the southern portion of the Lower Peninsula.

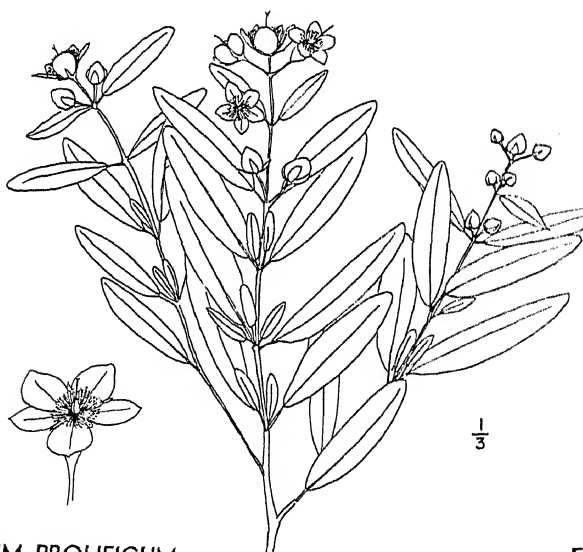
One or more varieties of this species have been named. By some they are regarded as geographical forms only and not entitled to varietal rank. They are omitted here.

Vitis bicolor LeConte. (Blue Grape, Winter Grape). Fig. 99. A long-trailing or high-climbing vine; bark cinnamon-colored; tendrils intermittent; branches terete; twigs and leaves glabrous or somewhat pubescent, bluish-glaucous or later without the bloom; leaves nearly orbicular in outline, up to 3 dm. long and as broad, deeply cordate at base, usually 3-lobed, the sinuses rounded, the lobes acute or acuminate, margin crenate-dentate, bright green and glabrous



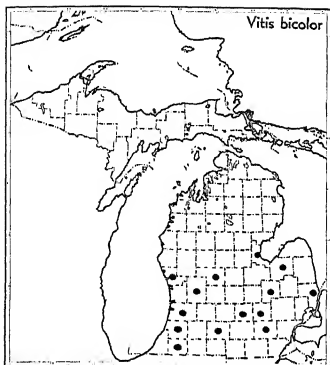
VITIS VULPINA

FIG. 101



HYPERICUM PROLIFICUM

FIG. 102



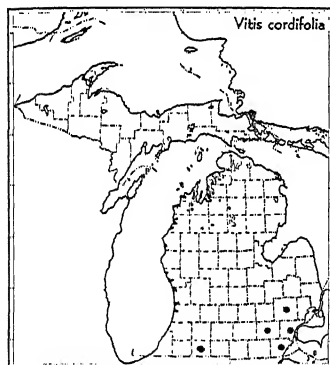
regarded merely as a northern form of it. It is likely that a large enough series of specimens would show complete intergrading. Fixing the definite status of this species would make an interesting problem for some amateur botanist.

above, glaucous or whitened below, the bloom sometimes disappearing at the end of the season; petioles stout, 8-15 cm. long; inflorescence compact; berries 8-10 mm. in diameter, bluish-black with a bloom, sour; seeds about 4 mm. long. Flowers, May, June; fruit ripe September, October.

Ranges from New Hampshire to Michigan, North Carolina, Tennessee and Missouri. Michigan, infrequent central and southern portion of Lower Peninsula.

According to 'Gray's Manual' *V. bicolor* resembles *V. aestivalis* except in a few characters. By some authors it is treated as a variety of that species and by others it is

Vitis cordifolia Michx. (Frost Grape, Chicken Grape). Fig. 100. High-climbing, large vines; bark loose; twigs glabrous or slightly pubescent, terete or indistinctly angled; pith interrupted; tendrils intermittent, forked; leaves simple, deciduous, alternate, 7.5 cm. wide, slightly 3-



lobed or unlobed, cordate with deep, acute sinuses, acuminate at the apex, sharply and coarsely dentate with acute teeth, thin, glabrous, or sparingly pubescent on the veins beneath; stipules small; petioles pubescent, or glabrous at maturity, usually shorter than the leaf midrib; inflorescence medium to large, loose with long peduncle; berries small black and shining, 8-10 mm. in diameter, ripening after a frost; seeds 2-3, about 4 mm. long. Flowers, May, June; fruit ripe October, November.

Thickets and stream banks Pennsylvania, southern New York to central Illinois, Missouri, Nebraska and southward. Michigan, distribution confined to the southern portion of the Lower Peninsula.

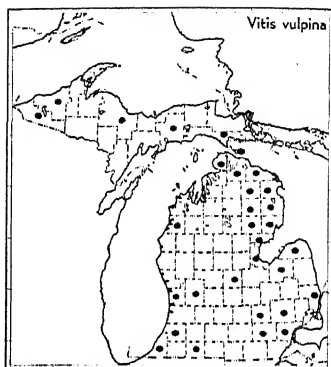
The Chicken Grape has little horticultural value and is seldom cultivated.

Vitis vulpina L. (River-bank Grape, Frost Grape). Fig. 101. Large climbing or trailing vines; bark shreddy; branches greenish, glabrous, terete or slightly angled; pith interrupted; tendrils intermittent; leaves deciduous, simple, alternate, thin, shining, 6-15 cm. long, mostly 3-7 lobed, the sinuses angular, the lobes acute or acuminate at the apex, teeth sharp; stipules 4-6 mm. long, sometimes persistent until the fruit is formed; petiole shorter than the midrib,

more or less pubescent; inflorescence compact; berries 8-10 mm. in diameter, bluish-black with a bloom, acid and juicy; seeds 2-4, about 5 mm. long. Flowers, May, June; fruit beginning to ripen in July, fall.

Stream banks or near water New Brunswick to West Virginia, North Dakota and Kansas. Michigan, throughout, but infrequent in the pine region.

The grapes intergrade and are difficult of determination, but it is to this species that I have referred most of those found growing so plentifully around the many lakes of southeastern Michigan.



HYPERICACEAE—ST. JOHN'S-WORT FAMILY

Herbs or shrubs; leaves deciduous, simple, mostly sessile, opposite, entire, dotted and without stipules; flowers regular; stamens many or few, sometimes collected in clusters; fruit a many-seeded capsule; plants usually smooth; flowers solitary or cymose.

The family consists of two genera, *Ascyrum* and *Hypericum*, of which only the latter is represented in Michigan.

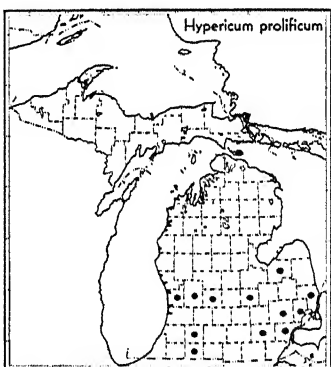
Hypericum [Tourn.] L.—ST. JOHN'S-WORTS

Pod completely 3-celled; styles 3; leaves petioled.....*H. prolificum*, p. 166
Pod completely 5-celled; styles 5; leaves sessile.....*H. Kalmianum*, p. 167

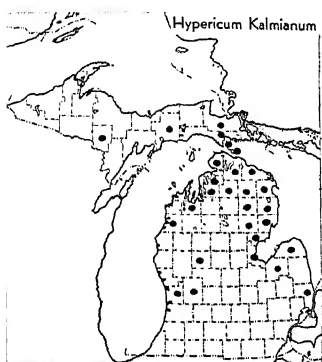
Hypericum prolificum L. (Shrubby St. John's-wort). Fig. 102. Erect bushy shrubs, 3-9 dm. high; branchlets 2-edged; bark shreddy; leaves deciduous, opposite, simple, linear-oblong or oblanceolate, 2-10 cm. long, 3-15 mm. wide, pale beneath, narrowed at the base or tapering, obtuse or often mucronate at the apex, punctate with small translucent dots; petiole 1-5 mm. long; flowers numerous in simple or compound terminal or axillary cymes, about 2 cm. across on pedicels 12 mm. long or shorter; sepals 5, subequal; petals 5, brilliant yellow, oblique; stamens numerous, distinct; capsule 3-celled, about 10 mm. long, many seeded; seeds about 2 mm. long, pitted. Flowers, July, September; fruit, autumn.

Found in sandy or rocky soil from New Jersey to Georgia, west to Michigan and Minnesota. Michigan, frequent lower half of the Southern Peninsula.

The flowers of Shrubby St. John's-wort are extremely showy, and as they are borne late in the season after most other shrubs are through blooming it makes a very desirable shrub for cultivation.



Hypericum Kalmianum L. (Kalm's St. John's-wort). Fig. 103. Low shrubs 3-7 dm. high, leafy; branches 4-angled; twigs flattened and 2-edged; leaves



simple, deciduous, opposite, oblanceolate or linear-oblong, obtuse 2-6 cm. long, 3-11 mm. wide, obtuse, or acute at apex, narrowed at the base, glaucous beneath; cymes terminal, few-flowered; pedicels 4-20 mm. long; flowers 2-2.5 cm. across; sepals foliaceous, oblong, acute, 6-8 mm. long; petals 5, golden yellow; stamens very numerous, distinct; styles 5, united below; capsule ovoid, 5-celled, about 7 mm. long; seeds numerous, about 1 mm. long. Flowers, August; fruit, autumn.

Rocky or sandy soil Quebec along the Great Lakes to Wisconsin, south to New York and Illinois. Michigan, throughout, more abundant northward.

Kalm's St. John's-wort is not as common as the preceding species. It was first discovered on the wet rocks at Niagara Falls and is most at home in the region of the Great Lakes.

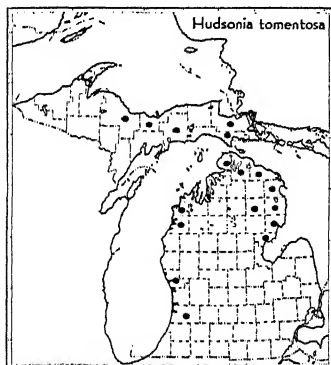
CISTACEAE—ROCKROSE FAMILY

Low shrubs or herbs; leaves alternate or opposite, simple, sometimes scale-like; flowers regular, generally perfect; sepals 3-5, persistent, when 5 the 2 outer much smaller and bract-like; petals 3-5 or wanting, convolute in the bud; stamens many, free; filaments slender; style single or none; ovary 1-celled; fruit a capsule opening by valves; seeds several or numerous.

A family of three genera, one of which is represented in Michigan by a single species.

Hudsonia L.—HUDSONIAS

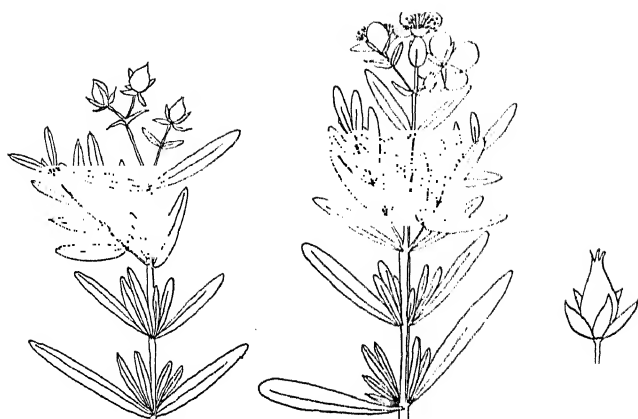
Hudsonia tomentosa Nutt. (Woolly Hudsonia). Fig. 104. Low, densely-



tufted, bushy shrubs, 1-2 dm. high, hoary-pubescent, pale; leaves persistent, alternate, simple, 2 mm. long, oval or oblong, imbricated and appressed; flowers numerous, sessile or on very short pedicels, bright yellow; sepals 3, obtuse and shorter than the obovate-oblong petals; stamens numerous; style long and slender; stigma minute; pod ovoid, inclosed in the calyx; seeds few. Flowers, May, June; fruit, summer.

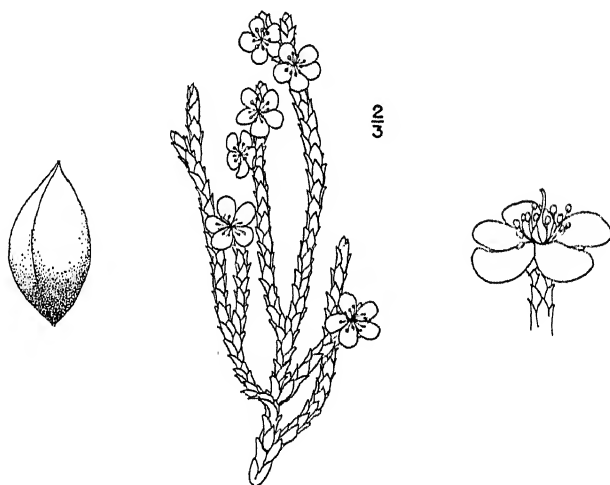
Sandy shores, dunes, etc. New Brunswick to Virginia and along the Great Lakes to Minnesota. Michigan, frequent both peninsulas, except in the interior.

The species passes into a variety which



HYPERICUM KALMIANUM

FIG. 103



HUDSONIA TOMENTOSA

FIG. 104

has been named *intermedia* by Peck. Its leaves tend to be more awl-shaped and its flowers are obviously peduncled.

This little gray bush is fairly frequent on the sand dunes along the shores of the Great Lakes. Through its long, slender root fibers it holds its own and flourishes in spite of the shifting sands.

THYMELAEACEAE—MEZEREUM FAMILY

Shrubs or trees with tough bark; leaves deciduous, alternate, simple and entire; flowers perfect, borne singly or in racemes or capitate clusters; calyx-tube cylindric or urn-shaped, colored; petals none; stamens twice as many as the lobes of the calyx and free from the ovary which is 1-celled and 1-ovuled; stigma mostly capitate; fruit a berry-like drupe.

Only one genus of this family is represented in Michigan.

Dirca L.—LEATHERWOODS

Dirca palustris L. (Leatherwood, Wicopy). Fig. 105. Shrubs, 0.5-2 m. high, widely branching; bark very tough, fibrous, grayish; branches jointed;



leaves alternate, deciduous, simple, entire, mostly obovate or oval, obtuse, glabrous or nearly so, 5-8 cm. long, 1.5-5 cm. wide, rounded at base, obtuse at apex; petioles very short; bud scales 3 or 4, oval or oblong, pubescent with brown hairs; flowers light-yellow, preceding the leaves, 3 or 4 in a cluster; petals none; calyx petal-like, campanulate, obscurely 4-toothed; stamens 8, inserted on the calyx above the middle, alternate ones longer; filaments very slender; ovary sessile; stigma small, capitate; fruit a red, oval-oblong drupe, about 12 mm. long; seed dark-brown. Flowers, April, May; fruit, June, falling early.

Damp rich woods New Brunswick to Minnesota, south to Florida and Mississippi. Michigan, frequent throughout.

The Leatherwood is one of our earliest flowering shrubs. It is conspicuous when it flowers, but its flowers fade and fall rapidly as the leaves expand. The bark is unusually tough and it has such strength that it is very difficult to break it by pulling. This accounts for its common name and for the fact that it was used by the Indians for cordage and in making baskets.

When taken internally the bark will produce vomiting and the berries are said to be narcotic.

ELAEAGNACEAE—OLEASTER FAMILY

Shrubs or small trees, mostly silvery-scaly or stellate-pubescent; leaves deciduous, simple, entire, alternate or opposite; flowers perfect, polygamous or dioecious, clustered in the axils or at the nodes of twigs of the preceding season;

DIRCA PALUSTRIS

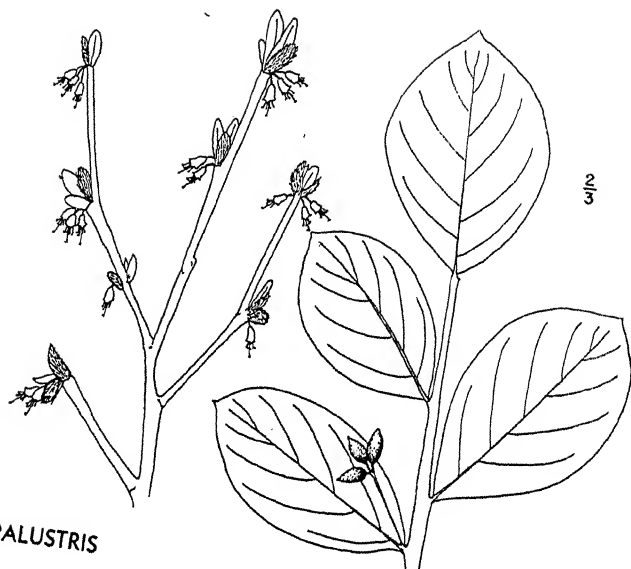


FIG. 105

SHEPHERDIA CANADENSIS

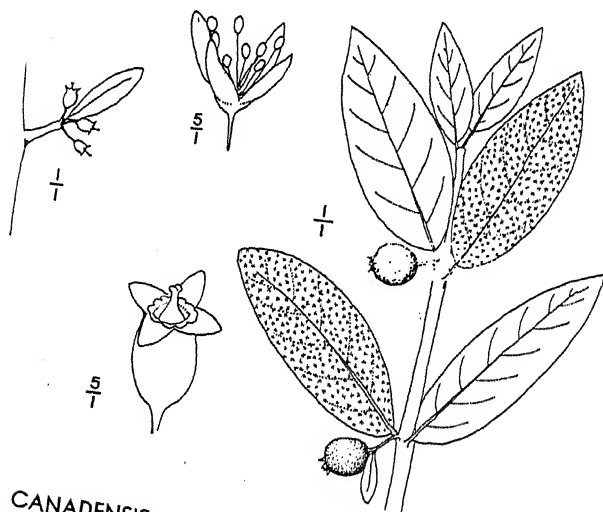


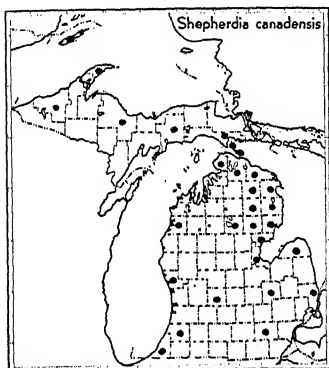
FIG. 106

calyx of perfect or pistillate flowers, urn-shaped, 4-lobed or -cleft, upper part deciduous; stamens 4 or 8, those of the perfect flowers borne on the throat of the perianth; filaments mostly short; disk annular or lobed; ovary sessile, 1-celled; ovule 1, erect; style slender; fruit drupe-like, the perianth base becoming thickened and enclosing the achene.

There are three known genera in this family of which the following is represented in Michigan with one species.

Shepherdia Nutt.—BUFFALO BERRY

Shepherdia canadensis (L.) Nutt. (Canadian Buffalo Berry). Fig. 106. A thornless spreading shrub, 1-3 m. in height; bark gray, or brownish on the



younger twigs; leaves simple, deciduous, opposite, ovate or oval, obtuse at the apex, rounded or narrowed at the base, 2-4 cm. long, 1-2.5 cm. wide, green and sparingly stellate-scurfy above, densely stellate-scurfy beneath; petioles 4-6 mm. long; flowers yellowish, small, dioecious, or sometimes polygamous, borne in short spikes at the nodes of the twigs, the pistillate few or sometimes solitary; pistillate flowers with a 4-lobed perianth, bearing an 8-lobed disk at its mouth nearly closing it, the sterile with a 4-parted calyx and 8 stamens alternating with the lobes of the disk; style slender, somewhat exserted; fruit drupe-like, 1 seeded, red or yellowish, oval, about 8 mm. long. Flowers,

April, May; fruit, July, August.

Growing on calcareous rocks and banks Newfoundland to Alaska, south to Nova Scotia, Maine, Vermont, western New York, Michigan, Wisconsin and Minnesota. Michigan, throughout.

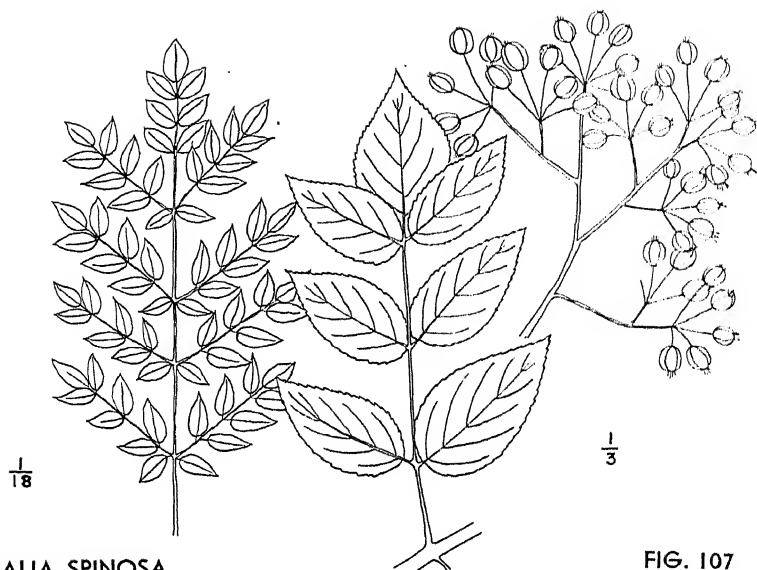
This is definitely a wildling species. It grows in different situations, but it is very hard to transplant and is seldom used in cultivation.

ARALIACEAE—GINSENG FAMILY

Herbs, shrubs or trees; stems frequently prickly or spiny; leaves deciduous, alternate or rarely opposite, simple or pinnately compound; flowers perfect or polygamous, borne in umbels, heads, racemes or panicles, mostly small, greenish or whitish; calyx small, toothed or entire; petals mostly 5, sometimes united at the apex, inserted on the margin of the calyx; stamens as many as the petals and alternate with them; ovary inferior, 1-several celled; styles distinct or united; fruit a berry or a drupe; seeds flattened or partially 3-angled.

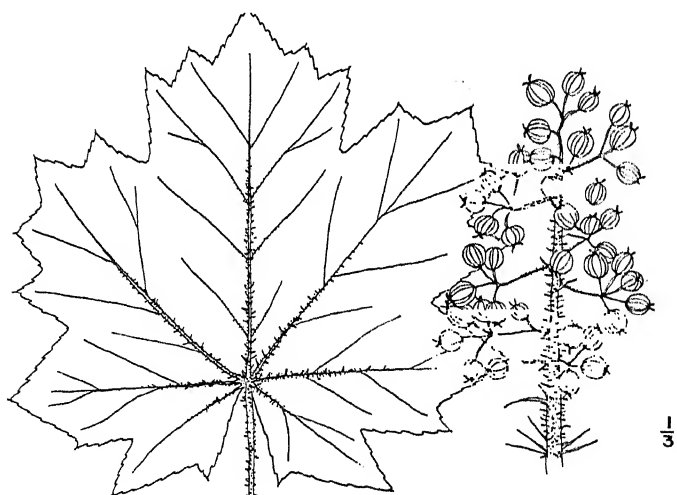
A family of about 50 genera and 450 species widely distributed in the temperate and tropical zones. The following genera are represented in Michigan.

Leaves compound; fruit black.....*Aralia*, p. 173
Leaves simple, but palmately lobed; fruit red.....*Fatsia*, p. 173



ARALIA SPINOSA

FIG. 107

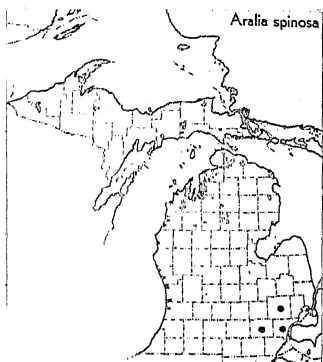


FATSIA HORRIDA

FIG. 108

Aralia [Tourn.] L.—SPIKENARDS

Aralia spinosa L. (Hercules' Club, Angelica-tree, Devil's Walking Stick). Fig. 107. Large, stout and erect shrub or a small tree; stem and branches spiny;



leaves deciduous, alternate, bipinnate, leaflets ovate, thick, acute or acuminate at the apex, rounded or subcordate at the base, on short stalks or sessile, 3-9 cm. long, 2-5 cm. wide, margin serrate, dark-green above, glaucous and sometimes more or less pubescent beneath or glabrous; petiole 2-5 dm. long, generally spiny; flowers perfect, white, 4 mm. wide, borne in umbels of from 10-30 flowers arranged in large terminal compound panicles; peduncles and pedicels pubescent; calyx 5-toothed; petals 5, spreading, obtuse; stamens 5; ovary 5-celled; styles 5, distinct; fruit ovoid, black, 5-lobed, about 6 mm. long. Flowers, June, August; fruit, September and October.

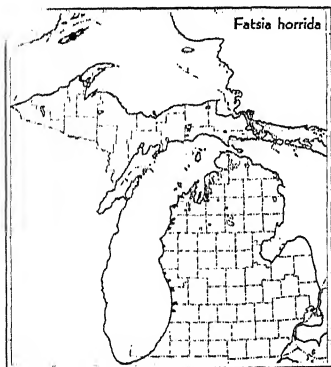
In low grounds and along streams, southern New York to Florida, west to Indiana, Missouri and Texas. Freely planted for ornament and sometimes escaping from cultivation farther north. Michigan: It is doubtful if this shrub is native to Michigan, but it is reported from several counties in the southern portion of the state where it has doubtless escaped from cultivation.

The Hercules' Club is particularly attractive on account of its large leaves and enormous panicles of white flowers. Farther north it is not fully hardy and it is liable to freeze back.

In addition to its usual common name of Hercules' Club or Devil's Walking Stick it is known as Toothache Tree, indicating some medicinal properties.

Fatsia Dcne. & Planch.—DEVIL'S CLUBS

Fatsia horrida (Sm.) B. & H. (Devil's Club). Fig. 108. A coarse shrub,

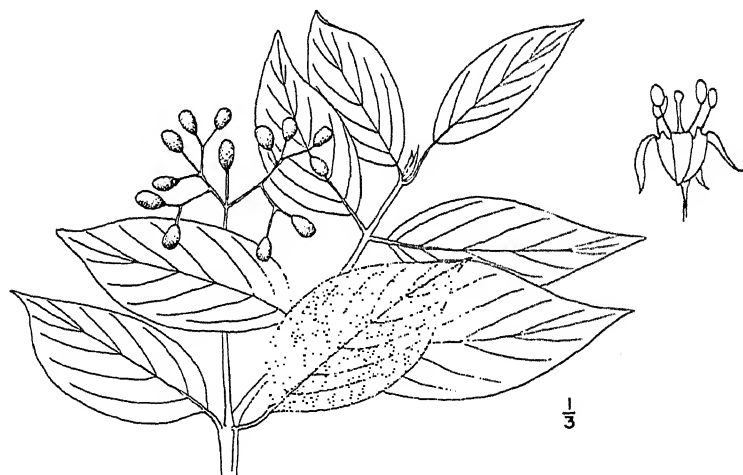


erect from a decumbent base, 2-3 m. in height; stems densely prickly, leafy above; leaves simple, alternate, deciduous, long-petioled, nearly round in outline, 1-3 dm. in diameter, palmately lobed, the 3-11 lobes acute, sharply and irregularly serrate, cordate at base with a narrow sinus, prickles scattered on the ribs beneath; flowers perfect or polygamous, greenish-white, borne in terminal paniculate umbels 1-3 dm. in length, the branches woolly; calyx-teeth obsolete; petals 5; stamens 5; filaments thread-like; anthers oblong or ovate; ovary 2-3 celled; styles 2; stigma terminal; fruit laterally compressed, 4-6 mm. long, scarlet. Flowers, June; fruit, August, September.



CORNUS CIRCINATA

FIG. 109



CORNUS AMOMUM

FIG. 110

In rocky places Isle Royale, Lake Superior, Montana to Oregon and southern Alaska; also in Japan. Michigan, only reported from Isle Royale.

The Devil's Club is essentially a plant of the northwest. See remarks under the heading of Rare Species.

CORNACEAE—DOGWOOD FAMILY

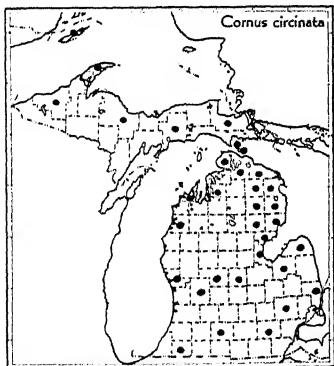
Shrubs or small trees, rarely herbs; leaves deciduous, simple, opposite or alternate, usually entire; flowers perfect; polygamous or dioecious, borne in cymes, heads or rarely solitary; calyx 4-5 dentate, adherent to the top of the 1-2 celled ovary; petals 4-5, or sometimes wanting, valvate or imbricate, inserted at the base of the epigynous disk; stamens as many as the petals and inserted with them; ovary inferior, 1-2 celled; style 1; ovules 1 in each cavity; fruit a drupe with 1-2 seeds.

This family includes two genera, one of which only is represented in Michigan.

Cornus [Tourn.] L.—DOGWOODS

1. Leaves opposite
 2. Pubescence woolly and more or less spreading
 3. Fruit blue
 4. Leaves broadly ovate or orbicular.....*C. circinata*, p. 175
 4. Leaves ovate or ovate-lanceolate.....*C. Amomum*, p. 177
 3. Fruit white
 5. Leaves oblong or ovate, rough above with harsh pubescence; branches brownish.....*C. asperifolia*, p. 177
 5. Leaves ovate to ovate-lanceolate, not rough above; branches red.....*C. Baileyi*, p. 179
 2. Pubescence closely appressed, straight and silky or none
 6. Leaves ovate, short pointed; twigs purple; fruit white.....*C. stolonifera*, p. 179
 6. Leaves ovate-lanceolate, taper pointed; twigs gray; fruit white.....*C. paniculata*, p. 181
1. Leaves alternate, clustered near the ends of the twigs; fruit blue.....*C. alternifolia*, p. 181

Cornus circinata L'Her. (Round-leaved Dogwood). Fig. 109. Shrubs 2-3 m. high; branches greenish, more or less warty-dotted; young twigs greenish-yellow, sparsely to woolly-pubescent; leaves



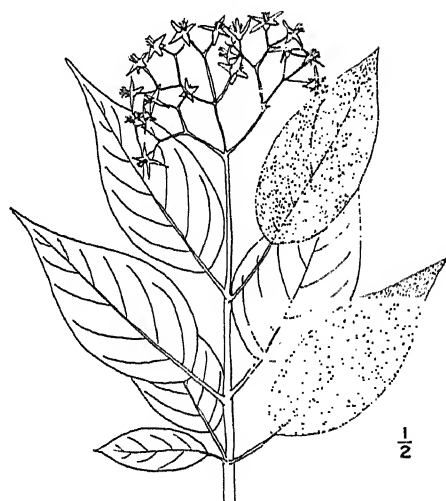
simple, opposite, deciduous, round-oval, 6-14 cm. long, 5-12 cm. broad, abruptly pointed, woolly beneath, mostly rounded at the base, finely appressed-pubescent above; petioles 1-2 cm. long; flowers perfect, white, in rather compact flat cymes, 3-7 cm. broad; peduncle and pedicels somewhat pubescent; sepals minute; petals ovate, 3-4 mm. long, becoming reflexed; stamens 4, exceeding the petals; ovary inferior, 2-celled; style slender; stigma capitate; fruit globose, pale blue, 5-6 mm. in diameter; stone subglobose, ridged. Flowers, May, June; fruit ripe September.

Growing in rich or sandy soil, or on rocks,



CORNUS ASPERIFOLIA

FIG. 111



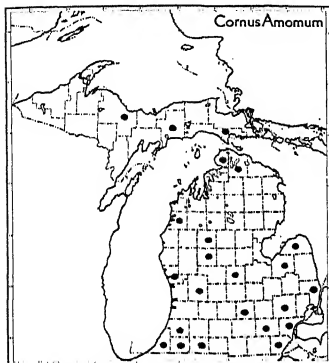
CORNUS BAILEYI

FIG. 112

from Quebec to Manitoba, south to Virginia, Indiana, Illinois, Iowa and North Dakota. Michigan, infrequent throughout; more abundant northward.

This is one of the most attractive of the dogwoods. In cultivation it will do best in a rather shaded position. The flowers are somewhat larger than usual for the dogwoods, and the fruit, though not plentiful, is attractive.

Cornus Amomum Mill. (Silky Cornel, Kinnikinnik). Fig. 110. Erect shrub 1-3 m. high; branches purplish; twigs appressed-pubescent; leaves simple, oppo-



sitive, deciduous, oval, narrowly ovate or ovate-lanceolate, narrowed or rounded at base, acuminate at apex, 5-12 cm. long, 1-3 cm. wide, glabrous or minutely appressed-pubescent above, pale-green, silky-downy, often rusty below; petioles 1-2 cm. long, somewhat pubescent; flowers perfect, cream-white, borne in flat cymes 3-5 cm. broad, the peduncle and pedicels pubescent; calyx-teeth lanceolate; petals 4, narrowly oblong, acute; stamens 4, exserted; ovary inferior, 2-celled; style slender; stigma capitate; fruit globose, dull pale-blue, about 6 mm. in diameter; stone oblique, ridged. Flowers, May, July; fruit ripe September.

In wet soil New Brunswick to North Dakota, south to Florida and Louisiana. Michigan, frequent throughout.

The Silky Cornel is the latest to bloom of any of the genus. This feature together with its abundant bright blue fruit give it a decided ornamental value.

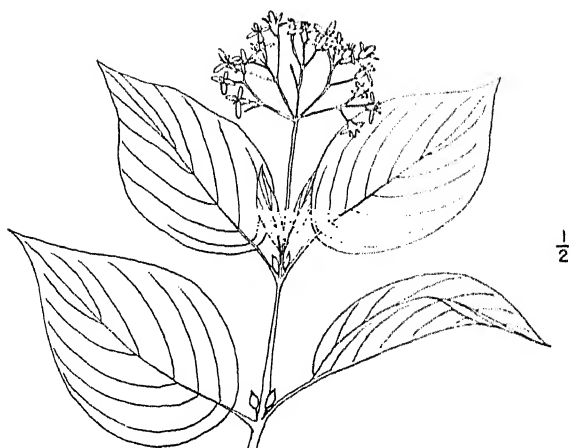
Cornus asperifolia Michx. (Rough-leaved Dogwood). Fig. 111. An erect shrub, up to 3 or 4 m. in height; stems reddish-brown; branchlets rough-pubescent; leaves simple, opposite, deciduous,



ovate-oval, or elliptic, acuminate at apex, rounded at base, entire, rough with a harsh pubescence above and downy beneath, 3-13 cm. long, about 6 cm. broad; petioles slender, rough hairy; flowers, perfect, cream-white, borne in loose cymes, 5-8 cm. broad, the branches and pedicels of which are rough-hairy; calyx-teeth minute; petals 4, about 3 mm. long, oblong-lanceolate; stamens 4, exserted; filament threadlike; stigma capitate; fruit globose, white, about 6 mm. in diameter; stone 5-6 mm. wide, 4-5 mm. high, variable in shape. Flowers, May, June; fruit ripe September.

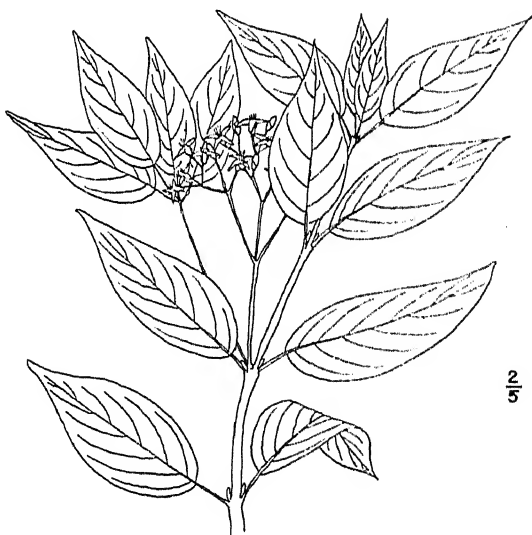
In wet soil or near streams north shore of Lake Erie to Minnesota, Kansas and southward. Michigan, infrequent throughout.

This species resembles the red osier, but its branches are brown instead of red



CORNUS STOLONIFERA

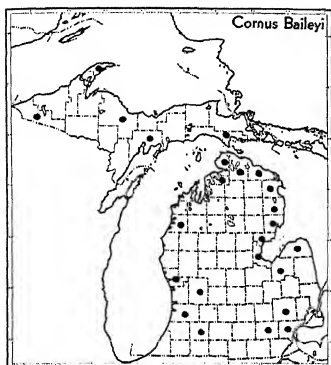
FIG. 113



CORNUS PANICULATA

FIG. 114

Cornus Baileyi Coult. & Evans. (Bailey's Dogwood). Fig. 112. Erect shrubs, 1-3 m. high, without stolons; stems purplish-red; branches brownish,



somewhat spreading-pubescent, becoming glabrous and purplish or red, not rough; leaves simple, opposite, deciduous, ovate to ovate-lanceolate, not scabrous, appressed-pubescent above, woolly-pubescent beneath, 3-13 cm. long, 1.5-6 cm. wide, long or short acuminate at the apex, rounded or narrowed at the base; petioles 0.5-1.5 cm. long, pubescent; flowers white, about 6 mm. in diameter, in compact cymes, 2-5 cm. broad, the branches of which are pubescent; buds short ovoid; calyx-lobes narrowly triangular, short, very pubescent; petals ovate-oblong; stamens exserted; style cylindrical; fruit pure white, about 6 mm. in diameter; stone flattened, oblique. Flowers from May throughout the

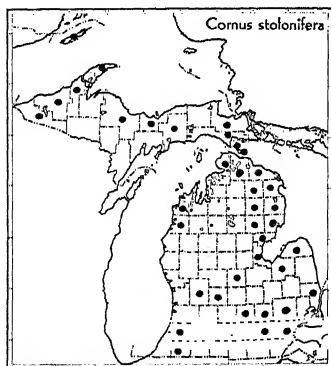
season; fruit July, October.

Sandy shores, in swamps and moist rocky places western Pennsylvania and southern Ontario to Minnesota and Manitoba. Michigan, infrequent throughout.

This dogwood which is confined principally to the Great Lakes region in its distribution was originally considered a form of *Cornus stolonifera*. The white woolliness of the lower surface of the leaves seems to be the most constant character by which to separate the two species.

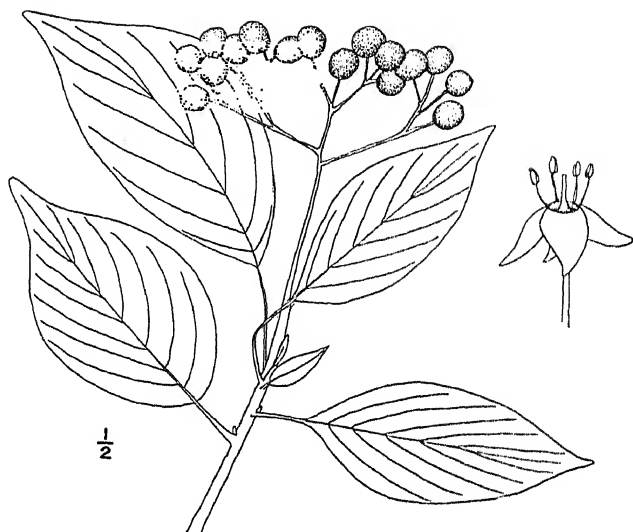
Bailey's Dogwood begins to bloom in May and it is not unusual to find it with flowers in October. Its fruit begins to ripen the first of July and likewise continues through the season to October. The berries are favorite food for several species of birds which no doubt appreciate the long season.

Cornus stolonifera Michx. (Red-osier Dogwood). Fig. 113. An erect or spreading shrub, 1-3 m. high, stoloniferous; bark purplish-red or bright-red,



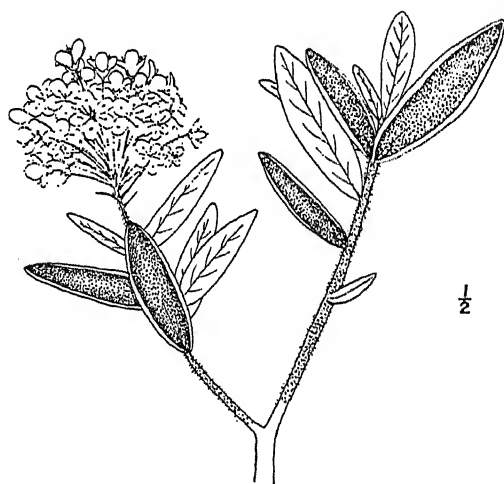
becoming more vivid, especially toward spring, glabrous; young branchlets green, pubescent, becoming glabrous; leaves opposite, simple, deciduous, entire, ovate to ovate-lanceolate or oval, 5-10 cm. long, 2-4 cm. wide, narrowed or rounded at the base, abruptly short-pointed at the apex, green and short appressed-pubescent above, under side whitish and somewhat appressed-downy; petioles stoutish, 1-2 cm. long; flowers white, borne in pubescent flat cymes, 2-4 cm. across; calyx with 4 minute teeth; petals 4, ovate oblong, 3-5 mm. long; stamens 4, exserted; filaments very slender; stigma capitate; fruit globose, white or whitish, 6-7 mm. in diameter; stone variable in size and shape.

Flowers, June, July; fruit, August, October.



CORNUS ALTERNIFOLIA

FIG. 115



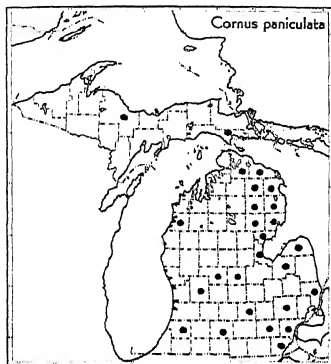
LEDUM GROENLANDICUM

FIG. 116

Generally in wet places Newfoundland to British Columbia south to Virginia, the Great Lakes region, westward to Iowa, Nebraska, New Mexico and California. Michigan, very common throughout.

The Red-osier is a very common northern shrub. It will be found in abundance in swampy areas where its glowing red-purple stems and branches are conspicuous, particularly in the winter against the snow.

Cornus paniculata L'Her. (Panicked Dogwood). Fig. 114. Erect branching shrub 1-2.5 m. high; stems,

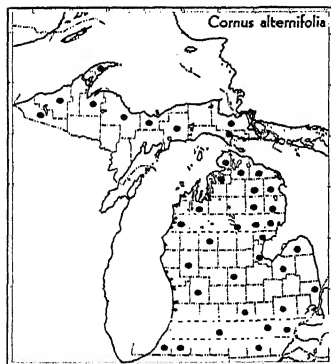


branches and twigs smooth and gray; leaves deciduous, opposite, simple, entire, ovate-lanceolate, wedge-shaped or obtuse at base, long-acuminate at the apex, 4-8 cm. long, 2-4 cm. wide, minutely appressed-pubescent on both sides, pale beneath; flowers perfect, cream-white, about 6 mm. in diameter, borne in loose convex cymes, the peduncle and branches more or less appressed-pubescent; calyx lobes triangular, minute; petals 4, lanceolate, spreading; stamens 4, exserted; filaments threadlike, inserted with the petals; ovary 2-celled, silvery-pubescent; stigma capitate; drupe on bright red pedicels, globose, white, 5-6 mm. in diameter; stone subglobose, slightly furrowed. Flowers, May, June; fruit, July, September.

In dry and wet places Maine to Ontario, Minnesota and southward. Michigan, common Lower Peninsula; also in Upper Peninsula.

The Panicked Dogwood is one of our most common shrubs. It grows abundantly along the roadsides and in fence rows bordering our fields and woods. It grows on the banks of streams and on hillsides and everywhere it makes a beautiful appearance when in flower. Its white fruit is set off to advantage by the bright red fruit-stalks, making it a doubly attractive shrub.

Cornus alternifolia L. f. (Alternate-leaved Dogwood). Fig. 115. A shrub



or small tree, 2-6 m. high; bark smooth, brownish on older stems; branches greenish, streaked with white; leaves simple, deciduous, alternate, entire, often clustered at the ends of the branches, ovate, obovate or oval, long-pointed, 5-9 cm. long, 3-6 cm. wide, mostly narrowed at the base, whitish and minutely pubescent beneath, yellow-green, at first pubescent, soon becoming glabrous above; petiole slender, 1-7 cm. long; flowers white, borne in a broad open cymose panicle, the peduncle stout, glabrous, the branches pubescent; sepals minute or obsolete; petals ovate-oblong, 3-3.5 mm. long; stamens exserted; stigma capitate; ovary

densely pubescent; drupe globose, 6-8 mm. in diameter, deep blue on reddish stalks; stone obovoid, shallowly channeled. Flowers, May, July; fruit, September.

In woods and coves New Brunswick, west to Minnesota and southward to Georgia, Alabama and Iowa. Michigan, frequent throughout.

Unlike all the other dogwoods this species has alternate leaves. It is often used in landscape work and its green stems and twigs give excellent results when grouped with other dogwoods for winter color effects.

ERICACEAE—HEATH FAMILY

Shrubs or herbs, often evergreen; flowers regular or nearly so; calyx free from the ovary, 4-5 parted or cleft, generally persistent; petals 4-5, more or less completely united; stamens usually 8-10, or at times the same number as the petals; style 1; ovary 3-10 celled; fruit a capsule, berry or drupe; seeds small.

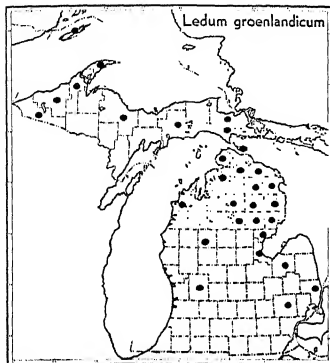
The Heath Family is a very large one comprising four well-marked, subfamilies. Subfamily *Ericoideae*, and Subfamily *Vaccinoideae*, include all the shrubs in Michigan belonging to this family. The following ten genera are represented:

1. Leaves evergreen and leathery
 2. Prostrate or creeping shrubs
 3. Leaves 1-4 cm. wide
 4. Leaves narrowed to the base, margin serrate; stem puberulent; foliage wintergreen flavor.....*Gaultheria*, p. 191
 4. Leaves cordate at the base, margin entire; stem bristly; not wintergreen flavored.....*Epigaea*, p. 189
 3. Leaves 4-10 mm. wide, green beneath, obovate to elliptical.....*Arctostaphylos*, p. 191
 2. Erect shrubs
 5. Leaves with strongly revolute margins, woolly or whitened below
 6. Leaves densely woolly below.....*Ledum*, p. 182
 6. Leaves merely whitened below, not woolly
 7. Leaves opposite.....*Kalmia*, p. 183
 7. Leaves alternate.....*Andromeda*, p. 185
 5. Leaf margin scarcely revolute, crenulate or serrate; leaves green or scurfy below.....*Chamaedaphne*, p. 189
1. Leaves deciduous (except in three species of *Vaccinium*)
 8. Lower surface of leaves covered with yellow resinous glands or dots
 9. Fruit a globose capsule.....*Lyonia*, p. 187
 9. Fruit a berry with 10 seed-like nutlets.....*Gaylussacia*, p. 193
 8. Lower surface of leaves not covered with yellow resinous glands or dots (persistent in 3 species); branchlets greenish or reddish; fruit a many-seeded berry.....*Vaccinium*, p. 195

Ledum L.—LABRADOR TEAS

Ledum groenlandicum Oeder. (Labrador Tea). Fig. 116. Erect evergreen shrub, 3-10 dm. high; bark gray; twigs brown-woolly; leaves simple, alternate, persistent, entire, oblong or linear-oblong, 2-5 cm. long, very obtuse, margins revolute, upper surface green, midrib depressed, lower surface completely

clothed with rusty wool; petiole about 2 mm. long; flowers in dense terminal clusters, white; sepals 5, united; petals 5, narrowly ovate, free; stamens 5-7, exserted; pistil 5-parted; ovary free from the calyx; fruit a slender capsule splitting from the base upward, many-seeded. Flowers, May, June; fruit, August, September.



Ranges from Greenland to Alaska south to New Jersey, Pennsylvania, Michigan, Wisconsin, Minnesota, Washington. Its habitat is bogs, damp thickets and mountain slopes where it is common northward. Michigan, common Upper Peninsula and northern portion of the Lower Peninsula.

Labrador Tea is essentially a citizen of the northland and an interesting example of a plant fitted to hold its own in a subarctic climate. It carries a thick woolly coat over its stems and on the under surface of its leaves which tends to prevent the loss of

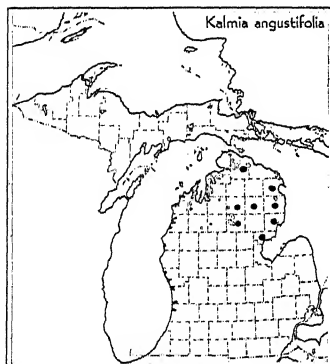
water through evaporation in cold, drying weather. In Michigan it follows that it is more common northward, but like many of the northern plants it is found in the bogs of our southern counties where it grows in association with the Pale Laurel. They bloom at the same time and it is difficult to imagine a more beautiful combination than the pink and white flowers make as they mingle together among the green leaves and their reflections are mirrored in a pool of dark bog water.

Kalmia L.—LAURELS

Leaves pale and glabrate beneath; twigs terete.....*K. angustifolia*, p. 183

Leaves white-glaucous beneath; twigs 2-edged.....*K. polifolia*, p. 185

Kalmia angustifolia L. (Sheep Laurel, Lambkill, Wicky). Fig. 117. Low, erect, evergreen shrub, rarely 1 m. tall; bark grayish-brown; branches terete,



glabrous or nearly so; leaves simple, persistent, mostly opposite or verticillate in 3s, pale and glabrate underneath, dark-green above, narrowly oblong, obtuse or sometimes acute, 2.5-6.5 cm. long, 6-22 mm. wide; petiole short; flowers in lateral compound or simple corymbs, slightly glandular, purple or crimson; corolla saucer-shaped, the limb with 10 pouches receiving 10 anthers; pedicels filiform, 12-24 mm. long, recurved in fruit; sepals 5, ovate, acute, glandular, persistent; fruit capsule depressed-globose, nearly smooth, 3-4 mm. in diameter; seeds small, subglobose. Flowers, June, July; fruit, September.



KALMIA ANGUSTIFOLIA

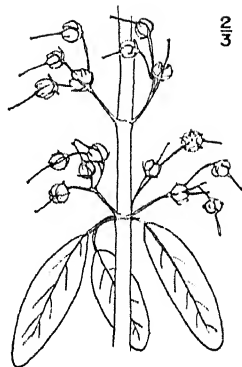


FIG. 117



$\frac{2}{3}$

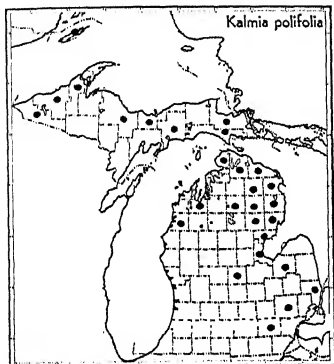
KALMIA POLIFOLIA

FIG. 118

The Sheep Laurel is found on hillsides, in pastures and bogs from Labrador to Ontario and southward. Michigan, upper part of Lower Peninsula.

As indicated by one of its common names, Lambkill, this laurel is credited with killing lambs. It also kills young calves. It is said that the older cattle know enough to let the plants alone, but that in the early spring when the tender leaves appear, the calves and young cattle eager for green food eat them and, unless promptly treated, die.

Kalmia polifolia Wang. (Pale Laurel, Swamp Laurel). Fig. 118. Low, straggling, evergreen shrub, 1-6 dm. high; twigs 2-edged; leaves simple, per-



sistent, opposite or sometimes in 3s, sessile or nearly so, oblong or linear-oblong, white-glaucous beneath, green above, 1-3 cm. long, 2-10 mm. wide, margins entire and revolute, tip blunt-pointed; flowers few in terminal clusters or umbels, rose-purple, about 1.5 cm. across; corolla saucer-shaped, five-lobed with 10 tiny sacs in the saucer into which the stamens are thrust; pedicels thread-like, 1-3.5 cm. long, erect even in fruit; sepals ovate, scarious-margined, persistent; capsule ovoid, smooth, about 5 mm. in diameter. Flowers, May, July; fruit, autumn.

In cold bogs and on the mountains Labrador to Alaska, south to New Jersey, Pennsylvania, Michigan, Minnesota and California. Michigan, infrequent throughout.

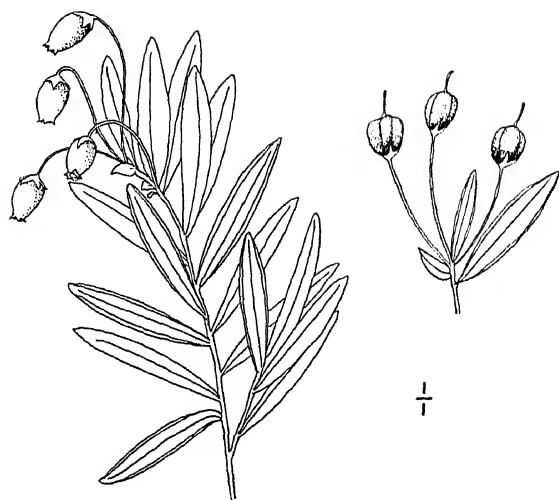
This beautiful little shrub is found in our deepest bogs. The blossoms are similar to those of the well known Mountain Laurel, but much smaller and a fewer number in each cluster. Where it occurs in great abundance, as it sometimes does in our northern swamps, it produces magnificent color effects.

Andromeda L.—WILD ROSEMARIES

Leaves whitened beneath with a varnish-like coat.....*A. Polifolia*, p. 185

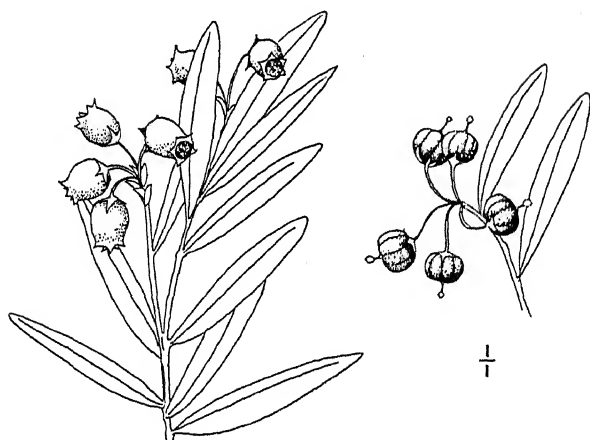
Leaves white beneath with close, fine pubescence.....*A. glaucophylla*, p. 187

Andromeda Polifolia L. (Wild Rosemary). Fig. 119. Low, glabrous, evergreen shrub with elongate creeping base; stem simple with ascending branches; bark brownish to gray; leaves simple, alternate, persistent, linear-oblong or lanceolate-oblong, flat or revolute, glabrous, generally whitened beneath with a varnish-like coat, later often green, tip mucronulate, narrowed at base, 2.5-6.5 cm. long, 4-8 mm. wide; petioles about 2 mm. long; flowers white, small, drooping in terminal umbels; pedicels filiform, straightish, 2-4 times longer than the nodding flower and erect fruit; corolla urceolate, with 5 recurved teeth; stamens 10, included; calyx 5-parted, persistent; capsule subglobose, brown or reddish, as high as broad; seeds small, oval, shining. Flowers, May, June; fruit, autumn.



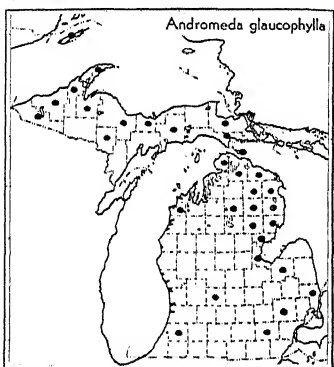
ANDROMEDA POLIFOLIA

FIG. 119



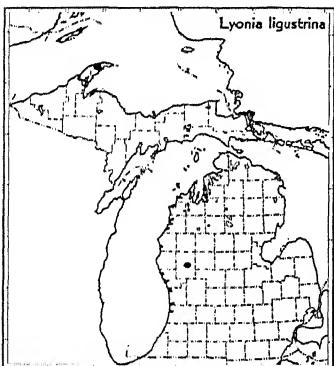
ANDROMEDA GLAUCOPHYLLA

FIG. 120



in Michigan than the former. There is considerable confusion in the two species of *Andromeda* here given, some authors treating them as one species.

Lyonia Nutt.—PRIVET ANDROMEDAS



Found in the Arctic regions, but extending very locally south to the Adirondack Mountains, Great Lakes region. Michigan, infrequent throughout.

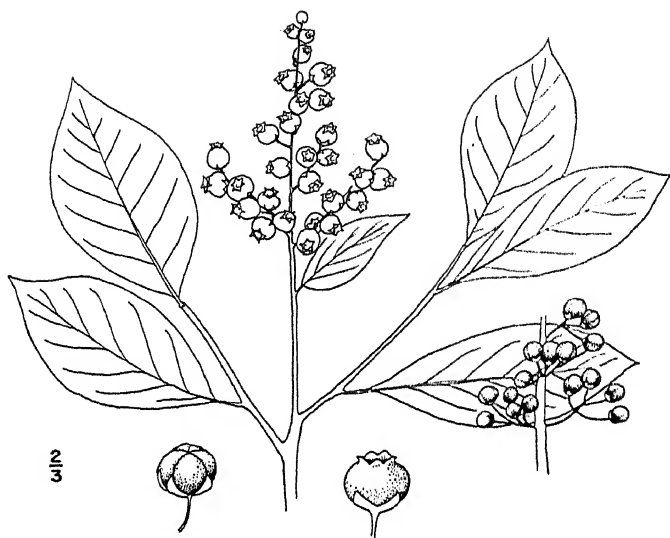
As with some of the other Arctic plants this species grows only in our deep sphagnum bogs.

Andromeda glaucophylla Link. (Bog Rosemary). Fig. 120. Low, branching evergreen shrub, 5-30 cm. high; bark brown to gray; branches glaucous; leaves simple, alternate, persistent, linear, 2-5 cm. long, 2-5 mm. wide, leathery, dark-green above, white beneath with close, fine pubescence, margins revolute, acute and mucronate at apex, base wedge-shaped, midrib prominent; flowers in small terminal umbel-like clusters on thickish curved pedicels rarely twice their length; corolla 5-parted, white or pinkish, about 6 mm. long; calyx-lobes whitish, usually spreading; capsule depressed, turban-shaped, glaucous; seeds numerous, shining, light-brown. Flowers, May, June; fruit, autumn.

Appropriate to its name the Bog Rosemary is found in bogs and on wet shores from Labrador to Manitoba, south to New Jersey, Pennsylvania and Minnesota. Michigan, frequent throughout.

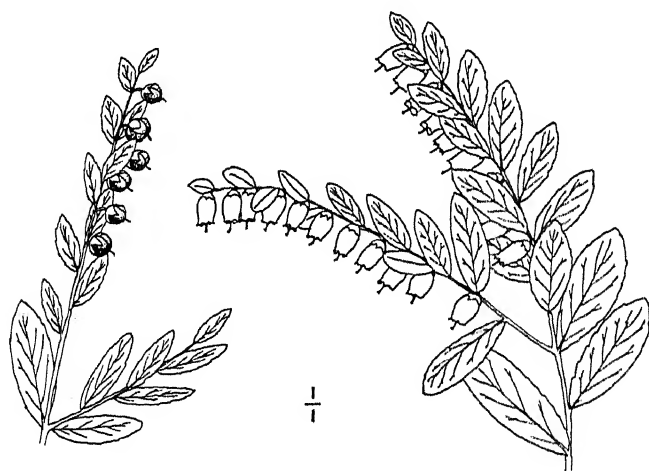
This species has a much wider distribution in Michigan than the former. There is considerable confusion in the two species of *Andromeda* here given, some authors treating them as one species.

Lyonia ligustrina (L.) DC. (Privet Andromeda). Fig. 121. A much branched shrub 0.5-3 m. high; twigs minutely pubescent or glabrous; leaves simple, alternate, deciduous, obovate, oblong, oval or lanceolate-oblong, 2.5-6.5 cm. long, acute at each end, or abruptly acuminate at the apex, serrulate or entire, mostly glabrous above, more or less pubescent on the veins below, or older leaves entirely glabrous; petiole short; flowers small, white, borne in numerous terminal many-flowered mostly leafless panicles; bracts small, soon falling; pedicels pubescent, 2-6 mm. long; calyx 5-lobed, the lobes triangular-ovate, acute; corolla globose,



LYONIA LIGUSTRINA

FIG. 121



CHAMAEDAPHNE CALYCVLATA

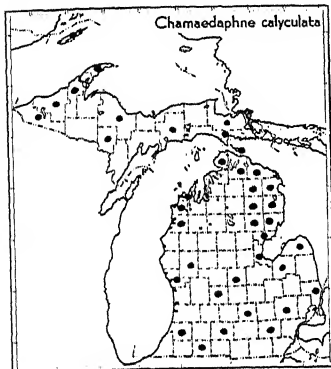
FIG. 122

5-toothed, the teeth recurved, mostly 3-4 mm. wide; stamens 8-10, included; filaments flat, pubescent, incurved, not appendaged; ovary 4-5 celled; style columnar; stigma truncate; capsule depressed-globose, obtusely 5-angled; seeds numerous, elongated. Flowers, June, July; fruit, autumn.

Moist thickets, central Maine to central New York and southward. Michigan: so far it has been reported from two stations only. Beal's 'Michigan Flora' records it from Keweenaw Point by Dr. Robbins, and Dr. Henry T. Darlington found it in Newaygo County in 1915. It will be noted that these two stations are far west of the general range of this shrub as given in 'Gray's Manual'.

Chamaedaphne Moench.—LEATHERLEAF

Chamaedaphne calyculata (L.) Moench. (Leatherleaf, Cassandra). Fig. 122. An erect, branched, evergreen shrub 3-10 dm. high; branches slender, with

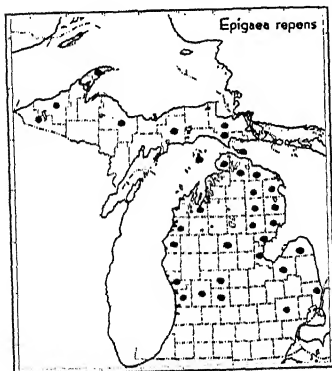


minute scurfy scales when young; leaves simple, alternate, evergreen, oblong, obtuse, flat, thick, coriaceous, scurfy beneath, 1-4 cm. long, 5-15 mm. wide, apex pointed, rounded at the base; petioles short; flowers in leafy racemes; calyx of 5 distinct, acute sepals; corolla cylindric of 5 united petals, white, about 5 mm. long; stamens 10, included; fruit a 5-celled depressed capsule, about 4 mm. across; seeds small and very numerous. Flowers, April, June; fruit, autumn.

The Leatherleaf has a range from Labrador to British Columbia south to Minnesota, Wisconsin, Illinois and Georgia, where it is found in bogs. Michigan, common throughout.

This shrub forms large beds in swamps or boggy meadows, and a *Chamaedaphne* swamp is one of our best marked ecological associations.

Epigaea L.—THE TRAILING ARBUTUS



Epigaea repens L. (Trailing Arbutus, Ground Laurel). Fig. 123. A prostrate or trailing semi-herbaceous plant, bristly with rusty hairs; leaves simple, alternate, evergreen, oval, oblong, ovate, reticulated, rough hairy, rounded or heart-shaped at the base, rounded or acute at the apex, green both sides, 2-7 cm. long, 1.5-4 cm. wide; petioles pubescent, 1-3.5 cm. long; flowers pink or white, in terminal clusters; sepals 5, oblong, persistent; corolla salver-form, with a 5-lobed limb; stamens 10, with slender filaments; style columnar; stigma 5-lobed; capsule depressed-globular, 5-lobed and 5-celled; seeds many, oval, dark-brown. Flowers, April,



EPIGAEA REPENS

FIG. 123



GAULTHERIA PROCUMBENS

FIG. 124

May; fruit, summer.

In sandy or rocky woods from Newfoundland to Saskatchewan, Wisconsin, Michigan, Kentucky and Florida. Michigan, rare in the southern counties, frequent in the central portion and common northward.

The Trailing *Arbutus* blooms early in the spring, sometimes before the snow is entirely gone from the hollows of the woods, exhaling a rich, spicy fragrance, and is probably our best known wild flower. For that reason it has been gathered almost to the point of extermination. If it is picked at all it should be done with the greatest care.

Gaultheria [Kalm] L.—AROMATIC WINTERGREENS

Gaultheria procumbens L. (Teaberry, Checkerberry, Aromatic Wintergreen). Fig. 124. Low creeping,



aromatic shrubs having underground stems, with erect branches; leaves simple, alternate, evergreen, borne at the top of the branches, thick and leathery, smooth, dark glossy-green above, paler below, oval to nearly orbicular, 2.5 cm. long, 1.3 cm. wide, margin crenate with shallow teeth, bristle-tipped, mostly rounded or sometimes wedge-shaped at the tip, narrowed or rarely rounded at the base; petioles 2.5 mm. long, more or less pubescent; flowers white or pale pink, single in the axils of the leaves on curved peduncles 4-8 mm. long, with 2 bracteoles close under the calyx; calyx 5-parted, persistent; corolla ovoid-urceolate, 4-6 mm. long, 5-toothed; fruit a depressed-globose berry formed of the calyx, slightly 5-lobed,

bright red when ripe, 8-12 mm. in diameter, mealy, very spicy; seeds numerous, small. Flowers, June, September; fruit remaining on over the winter.

From Newfoundland to Manitoba, south to Georgia, Tennessee, Michigan and Minnesota the Aromatic Wintergreen is found growing in thin, sandy woods. Michigan, common throughout.

The Wintergreen is one of our most interesting little plants. All parts of it, especially the fruit and leaves, contain the fragrant oil of wintergreen which is used in perfumery and in medicine. The commercial product, however, is generally made from the twigs and leaves of the black birch, which is lower in cost. A synthetic wintergreen oil is also made. The ripe fruit remains on the plant until May and June of the following season.

Arctostaphylos Adans.—BEARBERRIES

Arctostaphylos Uva-ursi (L.) Spreng. (Bearberry). Fig. 125. Trailing shrub; branches often rooting at the nodes; bark gray and rough, becoming smooth and reddish-brown; branchlets puberulent; leaves simple, evergreen, alternate, spatulate, obtuse, entire, glabrous or minutely puberulent toward the



ARCTOSTAPHYLOS UVA-URSI

FIG. 125



GAYLUSSACIA BACCATA

FIG. 126

base, 1-1.5 cm. long, 5-7 mm. wide, finely reticulate-veined; petioles about 2 mm. long; flowers few in short terminal racemes, white to pale pink; pedicels 2-4 mm. long, recurved; sepals 4-5, short, rounded; corolla ovoid, throat constricted, about 6 mm. long; stamens 8-10, included; fruit a globose drupe, bright cherry-red, 5-10 mm. in diameter, dry and inedible; seed, 5 coalescent nutlets. Flowers, May, June; fruit ripe July, September, remaining on all winter.



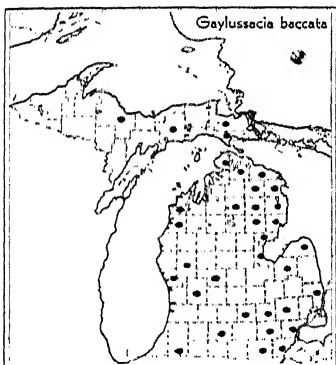
Dry, sandy or rocky soil Labrador to Alaska, New Jersey, Pennsylvania, Illinois, Nebraska, Colorado and California. Michigan, throughout; common northward, but rare southward.

The Bearberry has a number of common names and several varieties have been separated and named. Among the former may be mentioned Foxberry, Mealberry, Bear's

Grape, Barren Myrtle, Bilberry, Kinnikinnik.

Gaylussacia HBK—HUCKLEBERRIES

Gaylussacia baccata (Wang.) C. Koch. (Black Huckleberry). Fig. 126. Much branched shrub, 3-15 dm. high; twigs more or less pubescent; leaves



simple, alternate, deciduous, oval, oblong-ovate, or oblong, 2-4 cm. long, 1-2 cm. wide, acute, obtuse or rounded at the apex, base wedge-shaped, tough and leathery, thickly clothed beneath with shining resinous globules, margin entire, ciliate, green on both sides; petioles about 2 mm. long, pubescent; flowers in small lateral one-sided racemes; pedicels about the length of the flower, resinous-dotted as well as the peduncle, bracts and bractlets reddish; calyx-tube glabrous, covered with resinous scales, soon deciduous, tips of lobes broadly triangular; corolla ovoid-conical or oblong, reddish, 3-5 mm. long; stamens 10, included; fruit a black drupe, with bloom, about 7 mm. in diameter, edible; seeds about 10, more or less grown together. Flowers, May, June; fruit ripe, July.

Rocky woodlands, swamps and bogs Newfoundland to Manitoba south to Georgia and Kentucky, frequent throughout.

This huckleberry is exceedingly variable as to leaves, flowers and fruit. Several forms have been separated and named. Forma *glaucoarpa* (Robinson)

Mackenzie has blue fruit with a bloom, while forma *leucocarpa* (Porter) Fernald has its berries white to pinkish.



VACCINIUM STAMINEUM

FIG. 127



VACCINIUM PENNSYLVANICUM

FIG. 128

Vaccinium L.—BLUEBERRIES, CRANBERRIES

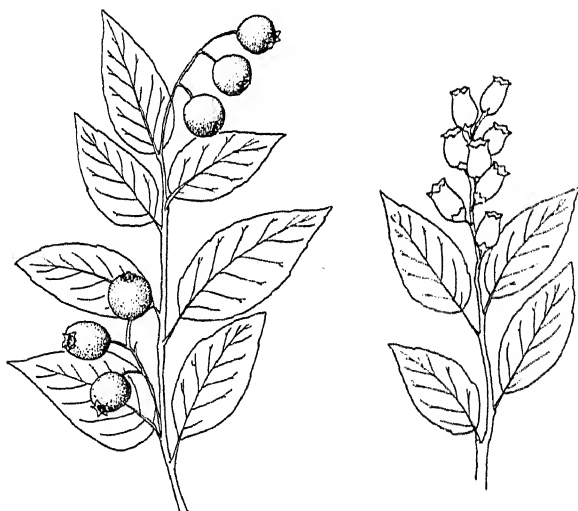
1. Leaves deciduous; shrubs with erect or ascending stems
 2. Low shrubs, 2-15 dm. high
 3. Leaves glaucous or very pale on the lower surface
 4. Berries greenish-yellow; branchlets recurved spreading, hairy not covered with speckles; leaves ovate or oval, pubescent; corolla open-campanulate, 5-lobed.....*V. stamineum*, p. 195
 4. Berries blue
 5. Leaves entire, elliptical, obtuse; corolla ellipsoid to globular, 4-5 toothed; filaments glabrous.....*V. ovalifolium*, p. 205
 5. Leaves entire or minutely ciliate-serrate, obovate or oval; corolla cylindraceous to campanulate, 5-toothed; filaments hairy.....*V. vacillans*, p. 199
 3. Leaves bright green on the lower surface
 6. Margins of leaves entire
 7. Leaves oblong-lanceolate, 2-4 cm. long, very pubescent; branches hairy and covered with speckles; berries blue.....*V. canadense*, p. 199
 7. Leaves oval, obovate or oblong, 5-20 mm. long, glabrous or nearly so; berries black.....*V. uliginosum*, p. 203
 6. Margins of leaves serrate or serrulate
 8. Berries black; leaves ovate, oval or oblong, acute or pointed, serrulate, 2-7 cm. long, nearly smooth; branchlets somewhat angled.....*V. membranaceum*, p. 205
 8. Berries blue
 9. Leaves lanceolate or oblong-lanceolate, serrulate, 1.5-3.5 cm. long; branches grooved or lined, warty.....*V. pennsylvanicum*, p. 197
 9. Leaves obovate or spatulate, 1-4 cm. long, serrate; branches round.....*V. caepitosum*, p. 203
 2. Tall shrubs, 1-4 m. high
 10. Leaves smooth or only slightly pubescent, entire, half grown at flowering time; berries blue-black with a bloom.....*V. corymbosum*, p. 201
 10. Leaves downy or woolly underneath, entire, unexpanded at flowering time; berries polished-black without bloom.....*V. atrococcum*, p. 201
 1. Leaves persistent, leathery; stems trailing or creeping
 11. Stems somewhat tufted, forming mats; leaves obovate or oval, margins revolute, entire, smooth and shining above, dotted with blackish bristle-points below; berry dark-red, 8-10 mm. in diameter.....*V. vitis-Idaea* var. *minus*, p. 205
 11. Stems slender, creeping or trailing, prostrate
 12. Leaves oblong or ovate, strongly revolute, 3-8 mm. long; berry globose, 6-8 mm. in diameter.....*V. oxycoccus*, p. 207
 12. Leaves oblong-elliptic, 6-17 mm. long, slightly revolute; berry 1-2 cm. in diameter.....*V. macrocarpon*, p. 207

Vaccinium stamineum L. (Deerberry, Squaw Huckleberry). Fig. 127. A divergently branched shrub, 6-15 dm. high; branches more or less pubescent; leaves simple, alternate, deciduous, ovate, oval or sometimes obovate, acute or acuminate at the apex, rounded or cordate at the base, entire, firm, green above,



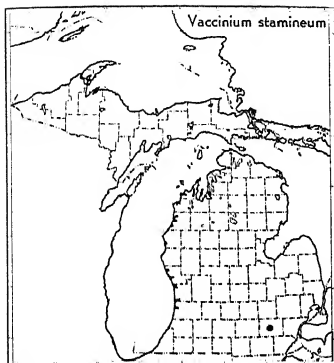
VACCINIUM CANADENSE

FIG. 129



VACCINIUM VACILLANS

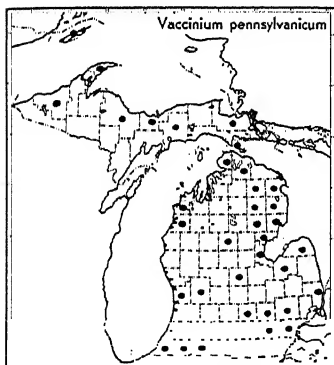
FIG. 130



Massachusetts to Ontario, Minnesota, Arkansas, Kentucky and Alabama. Michigan, recorded only from Washtenaw County.

The Deerberry is said to flourish in cultivation where with proper handling it develops into a very fine shrub.

Vaccinium pennsylvanicum Lam. (Low Sweet Blueberry, Early Sweet Blueberry). Fig. 128. Dwarf, upright shrub, 2-5.5 dm. high; stems yellow-green,



warty with pubescent lines; leaves simple, alternate, deciduous, lanceolate or oblong-lanceolate, 1.5-3.5 cm. long, 0.5-1.5 cm. wide, acute at the apex, narrowed at the base, margin distinctly serrulate with bristle-pointed teeth, thin, bright green, smooth both sides, or sometimes with a few hairs on the midrib beneath; petioles short, ciliate; flowers borne in few-flowered racemes generally with the leaves, bracts reddish; calyx attached to the ovary, 5-toothed; corolla white or pinkish, 6-7 mm. long, cylindric-bell-shaped, 5-toothed, teeth acute, somewhat reflexed; stamens 10, included; filaments short, hairy; style straight, very slightly exserted; berry globular, 6-10 mm. in diam-

eter, blue with a bloom. Flowers, May, June; fruit, July, August.

In dry, rocky or sandy soil Newfoundland to southern New Jersey, westward to Illinois and Michigan. Michigan, throughout.

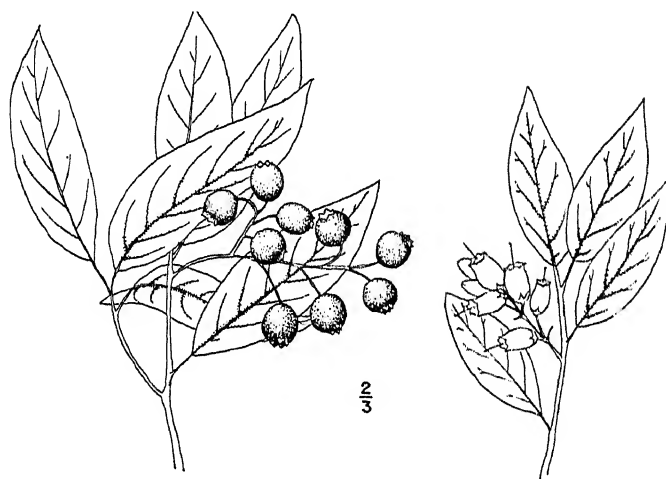
This is the earliest of the blueberries. Its typical habitat is thin sandy soil, covering the ground in many sections of our state and furnishing a considerable portion of the market blueberries.

Variety *nigrum* Wood, has black berries without bloom and forma *leuocarpum* Deane has dull white fruit. These may be looked for with the type. Another variety, *angustifolium* (Ait.) Gray, with narrow lanceolate leaves, a dwarf high-mountain or northern form has been reported from the Upper Peninsula.



VACCINIUM CORYMBOSUM

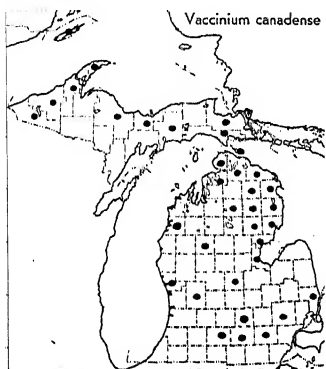
FIG. 131



VACCINIUM ATROCOCCUM

FIG. 132

Vaccinium canadense Kalm. (Sour-top or Velvet-leaf Blueberry, Canada Blueberry). Fig. 129. Low shrubs, erect or ascending 2-5 dm. high; branches

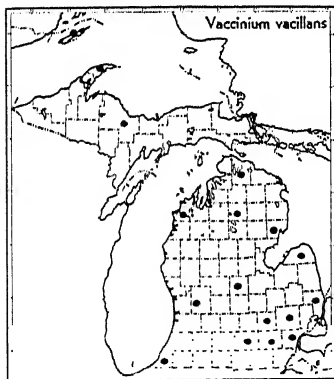


and twigs pubescent, greenish-brown; leaves simple, alternate, deciduous, oblong-lanceolate or elliptic, entire, downy both sides, acute or rounded at the apex, base wedge-shape or rounded, 2-4 cm. long, 0.5-1.5 cm. wide; petioles about 1 mm. long; flowers few in the clusters, opening with the leaves; pedicels generally shorter than the flowers; calyx 5-toothed, glabrous; corolla 5-toothed, oblong-campanulate, greenish-white, tinged with pink, about 4 mm. long and 3 mm. thick; stamens 10, not exserted; filaments hairy; style included; berry depressed globose, blue, rarely white, with much bloom. Flowers, May, June; fruit, July, August.

Dry plains, swamps or moist woods
Labrador to Manitoba, south to Virginia and Illinois. Michigan, throughout.

The fruit of the Canada Blueberry is edible, but not as palatable as that of some of the other species. The rare form with white fruit has been separated as forma *chiococcum* Deane.

Vaccinium vacillans Kalm. (Late Low Blueberry, Dryland Blueberry, Blue Huckleberry). Fig. 130. A stiff, branching shrub 3-9 dm. high; branches and



twigs yellowish-green, glabrous; leaves simple, alternate, deciduous, obovate or oval, 2.5-4.5 cm. long, 1.5-2.5 cm. broad when full grown, very pale or dull, glaucous beneath, acute or obtuse at the apex, narrowed at the base, entire or minutely ciliate-serrulate; petioles 1-2 cm. long; flowers before the leaves are half grown in racemose clusters; calyx 5-toothed, adnate to the ovary, usually reddish; corolla 5-toothed, 5-8 mm. long, greenish-yellow, tinged with red, oblong-cylindric, somewhat narrowed at the throat; stamens 10, included; filaments hairy; berries globular, blue with a bloom, about 8 mm. in diameter. Flowers, May, June; fruit, late July to September.

Dry places New Hampshire, Ontario, Michigan south to Georgia, Tennessee and Kansas. Michigan, throughout.

The fruit of this blueberry is of good size and is borne in large quantities. It is conveniently produced at the ends of the branches where it is easily picked. As in the case of other species of vacciniums it is inconstant and varieties with black fruits have been found.



VACCINIUM ULIGINOSUM

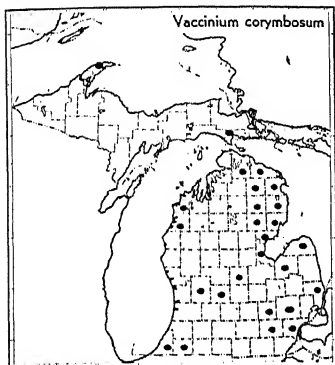
FIG. 133



VACCINIUM CAESPITOSUM

FIG. 134

Vaccinium corymbosum L. (High-bush or Swamp Blueberry, Tall Blueberry). Fig. 131. Erect shrub 1-4 m. high, stems and branches grayish or mottled; twigs greenish-brown, warty, glabrous or puberulent in lines; leaves simple, alternate, deciduous, ovate to elliptic-lanceolate, entire or serrulate, sometimes ciliate, mostly acute at each end, green and glabrous above, paler, smooth or slightly pubescent beneath, 4-8 cm. long, 2-4 cm. broad; petioles 1-2 mm. long; flowers appearing when the leaves are about half grown, borne in short racemes, as long or longer than the pedicels; bracts deciduous; calyx 5-lobed, glaucous; corolla white or pinkish, 6-10 mm. long, varying cylindric-urn-shaped to ovoid, 5-toothed, the teeth reflexed; stamens 10; stigma small; berries blue-black with more or less bloom, 7-10 mm. in diameter.



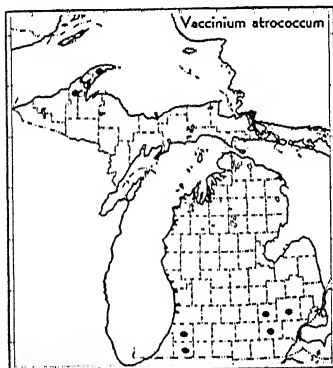
Flowers, May, June; fruit, July, August.

Swamps, thickets and woods Maine to Virginia, Minnesota and south to Louisiana. Michigan, common throughout.

In Michigan this is the common blueberry of our swamp areas where it reaches its maximum height. I have never found it growing in pastures or upland woods here although it may do so. The fruit of this species is the latest to ripen and furnishes a major portion of the blueberries found in our markets.

Like the others this *vaccinium* is exceedingly variable and several varieties have been named. The foregoing description has been drawn to include them as they no doubt completely intergrade.

Vaccinium atrococcum (Gray) Heller. (Black High Blueberry): Fig. 132. Shrub 2-4.5 m. high; branches minutely warty; branchlets pubescent; leaves



simple, alternate, deciduous, entire, downy or woolly beneath, even when old, dark green above, light green beneath, mostly acute at both ends, mucronate, thick, 3.5-7.5 cm. long, 1.2-3.5 cm. wide; flowers in short racemes, appearing with leaves; pedicels about the length of the flowers; calyx 5-lobed; corolla ovoid to short-cylindric, yellowish or greenish-red, 5-8 mm. long, about 3 mm. thick, 5-toothed, throat contracted; stamens 10, included; filaments pubescent; berries black and shining, without bloom, sweet and pleasant, 5-8 mm. in diameter. Flowers, May, June; fruit, July, August.

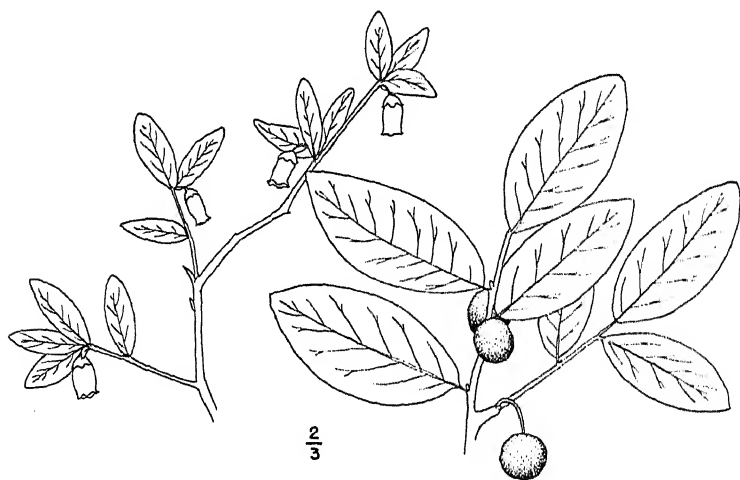
In swamps and low woods New Brunswick and Ontario to New Jersey, North Carolina and Ontario. Michigan, infrequent both peninsulas.

By some authors this blueberry is regarded only as a variety of *V. corym-*



VACCINIUM MEMBRANACEUM

FIG. 135

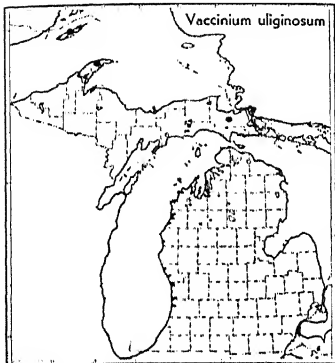


VACCINIUM OVALIFOLIUM

FIG. 136

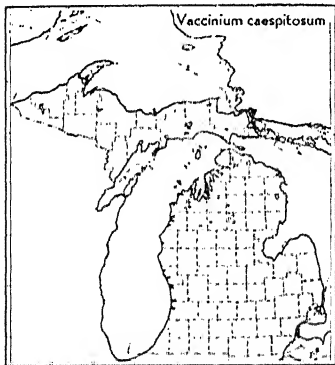
bosum L. which it closely resembles. Be that as it may there are many varieties, differing in the size of the bush, which changes according to the soil in which it is growing, and also in size, shape and color of the flowers. It flowers and fruits a week or ten days earlier than *V. corymbosum* L.

Vaccinium uliginosum L. (Bog Bilberry). Fig. 133. Low and spreading, much-branched shrub, 1.5-6 dm. high; stems stiff, round and smooth; leaves simple, alternate, deciduous, oval, obovate or oblong, wedge-shaped at base, apex rounded, thick, glabrous or nearly so, dull, pale or glaucous and somewhat pubescent beneath, entire, nearly sessile, 5-20 mm. long 2.5-10 mm. wide, finely reticulate-veined; flowers solitary, or in clusters of 2-4 with a scaly bud, mostly shorter than the pedicels; calyx 4-, rarely 5-lobed; corolla short urn-shaped, pink, 4-toothed; stamens 8, included, 2-awned on the back; filaments smooth; style shorter than the corolla; berries globular, about 6 mm. in diameter, bluish-black with a bloom, sweet and edible. Flowers, June, July; fruit, July, August.



The Bog Bilberry is found throughout Arctic America, Europe and Asia. Also on the summits of the high mountains of New England and New York, mostly above timber line, along the shores of Lake Superior and northward to Alaska. Michigan, recorded only from the Upper Peninsula.

Vaccinium caespitosum Michx. (Dwarf Bilberry). Fig. 134. A dwarf, much-branched shrub, nearly glabrous throughout, 5-30 cm. high; branches rounded; leaves simple, alternate, deciduous, thin, obovate, wedge-shaped at base, obtuse or acute at the apex, 1-4 cm. long, 4-20 mm. wide, smooth and shining, serrate with small, blunt teeth, nearly sessile; flowers drooping, mostly solitary in the axils of the leaves; pedicels 2-3 mm. long; calyx slightly 5-toothed, or rarely 4-toothed; corolla obovoid or oblong-obovoid, pink or white, about 5 mm. long; stamens 10, included; filaments smooth, style straight, about equalling the corolla; berries, globular, blue with a bloom, about 6 mm. in diameter, sweet and edible. Flowers, June, July; fruit, August.



Gravelly or rocky woods and shores Labrador to Alaska south to southern Maine, Vermont, northern Michigan, Wisconsin, Colorado and California. Michigan, within the general range, but not so far reported. See comments in section on rare species.



VACCINIUM VITIS-IDAEA

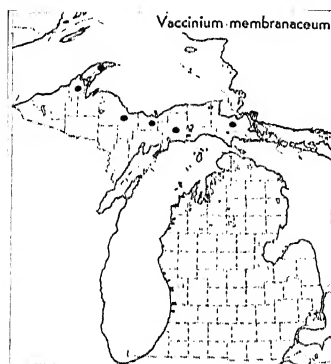
FIG. 137



VACCINIUM OXYCOCCOS

FIG. 138

Vaccinium membranaceum Dougl. (Thin-leaved Bilberry). Fig. 135. Erect branching nearly glabrous shrub, 3-15 dm. high; twigs somewhat angled;

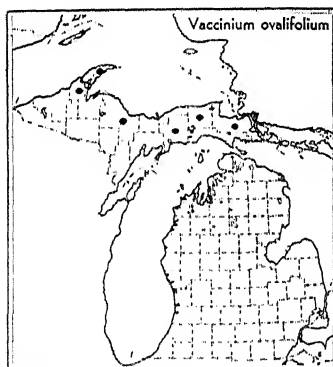


leaves simple, alternate, deciduous, thin, dull, oval, oblong or ovate, green both sides and nearly smooth, acutish to acuminate, sharply and finely serrate, 2-7 cm. long, 1.5-3 cm. broad when full grown; flowers nodding, solitary on short axillary peduncles; calyx border almost entire; corolla depressed-globular, greenish or purplish, usually 5-toothed; stamens 10, included; anthers 2-awned on the back; berries large, dark-purple to black, rather acid. Flowers, June, July; fruit ripe July, August.

In moist woods northern Michigan, Oregon and British Columbia. Michigan, Upper Peninsula.

This is a western shrub which has its recorded eastern limit in our state.

Vaccinium ovalifolium Sm. (Tall or Oval-leaved Bilberry). Fig. 136. A straggling shrub, 9-15 dm. high; branchlets sharply angled, glabrous; leaves



simple, alternate, deciduous, glabrous, elliptical, obtuse, nearly entire, 2.5-5 cm. long, green above, pale and glaucous beneath, thin, occasionally with a small abrupt tip; petiole short; flowers solitary on short, recurved pedicels; calyx 5-toothed; corolla globose-ovoid; stamens 10, included; filaments glabrous; berries blue, 8-10 mm. in diameter. Flowers, June, July; fruit, September, October.

Woods and mountain slopes Quebec to northern Michigan, Oregon and Alaska. Michigan, Upper Peninsula.

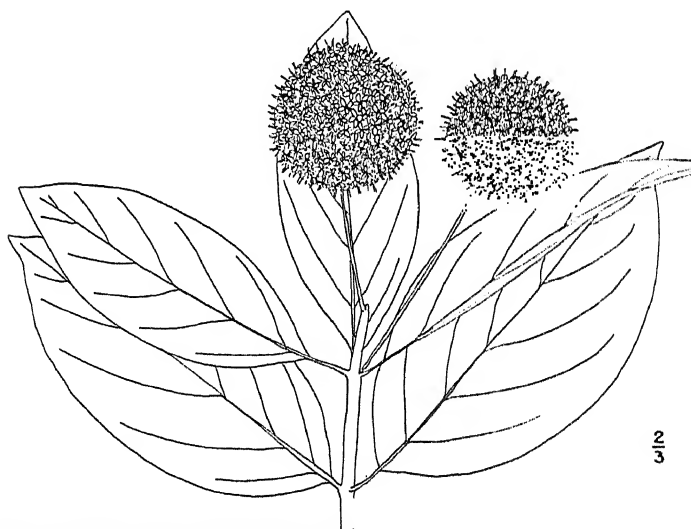
This is distinctly a northern plant and is reported only from the Upper Peninsula.

Vaccinium Vitis-Idaea L. var. *minus* Lodd. (Mountain Cranberry, Rock Cranberry). Fig. 137. A low evergreen shrub, 2-15 cm. high; stems creeping and forming mats, branches erect; leaves simple, alternate, evergreen, crowded on the branches, obovate or oval, margins revolute, entire or sparingly serrate, thick and leathery, green and shining above, paler and black-dotted beneath, glabrous or minutely pubescent toward the base, 5-18 mm. long, 4-9 mm. broad; petiole short; flowers white or pinkish, borne in short terminal 1-sided racemes, nodding; pedicels shorter than the corollas; bracts reddish, short-oblong; calyx 4-toothed; corolla open bell-shaped, 4-lobed; stamens 8; ovary 4-celled, inferior; fruit a dark-red berry, globular 8-10 mm. in diameter, bitter acid, edible when cooked. Flowers, June, July; fruit, August, September.



VACCINIUM MACROCARPON

FIG. 139



CEPHALANTHUS OCCIDENTALIS

FIG. 140



simple, alternate, evergreen, oblong or ovate, 3-8 mm. long, 1-3 mm. wide, strongly revolute, acute or obtuse at the apex, rounded or cordate at the base, entire, dark green and glabrous above, white beneath; petioles very short; flowers 1-6 in slightly racemose clusters, nodding; pedicels slender, erect, 1.5-5



Arctic America south to the mountains of Maine, New Hampshire and Vermont, Lake Superior, British Columbia and Alaska. Michigan, Isle Royale, Keweenaw County.

In the far north the fruit of the Mountain Cranberry is gathered in large quantities for household use. It is also eaten extensively by the larger migratory birds, in some instances being their only food.

Vaccinium Oxycoccus L. (Small Cranberry). Fig. 138. Creeping or trailing prostrate shrub; stems very slender, rooting at the nodes; branches nearly capillary, erect or ascending, more or less pubescent; leaves

cm. long with 2 bracts below or at the middle; calyx 4-parted; corolla pink or rose colored, 4-parted, the segments 5-6 mm. long, reflexed; filaments puberulent $\frac{1}{2}$ as long as the anthers; berries 6-8 mm. in diameter, reddish, acid. Flowers, May, July; fruit, August, September.

In cold sphagnum bogs Newfoundland to Alaska, New Jersey, North Carolina, Michigan and British Columbia. Michigan, infrequent throughout.

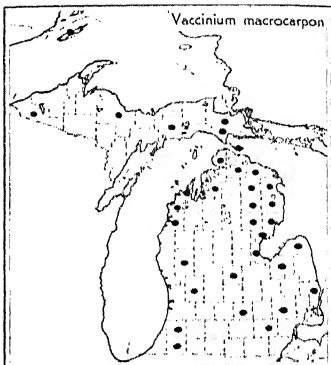
The Small Cranberry has a wide distribution in Michigan. It may be found growing with the Large Cranberry in many of our bogs. Variety *intermedium* Gray, coarser in all respects and generally with more flowers might be looked for in the same locations as the species.

Vaccinium macrocarpon Ait. (Large or American Cranberry). Fig. 139. Creeping prostrate shrub, rooting at the nodes, comparatively stout, often up to 1 m. long; branches erect or ascending, more or less pubescent; leaves evergreen, alternate, simple, oblong-elliptic, 0.6-1.7 cm. long, 0.2-0.5 cm. wide, blunt or rounded at the tip, rounded at the base, pale or somewhat whitened beneath, glabrous, upper side dark-green, glossy, flat or slightly revolute, margin entire; petioles about 1 mm. long, slender; flowers 1-8 in slightly racemose clusters, the elongated rachis of which is terminated by a long, leafy shoot, nodding on erect, pubescent pedicels, 2-4 cm. long bearing toward the tip 2 flat leaf-like bractlets; calyx 4-parted, the lobes ciliate; corolla pink, its 4 segments 6-10 mm. long, reflexed; stamens 8, exserted; filaments puberulent, about one-third the length of the anthers; style straight; berry globose, red, 1-2 cm. in

diameter, acid. Flowers, June, July; fruit, September, October.

Open bogs, swamps and wet shores Newfoundland to western Ontario, Virginia, Michigan and Arkansas. Michigan, common throughout.

This is the common cranberry of commerce. It is cultivated extensively on Cape Cod, in New Jersey and Wisconsin. It has not been grown commercially in Michigan, although many bushels are picked and disposed of from the native bogs in good fruiting years. It is frequent in our sphagnum bogs throughout the state. The fruit often remains on the vines until the following season and it is not uncommon to find flowers and mature berries on the same plant.



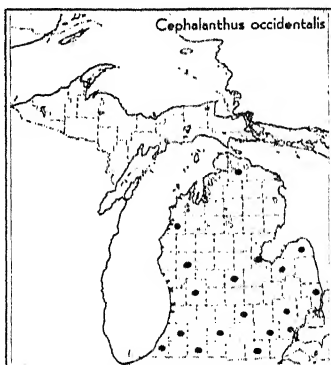
RUBIACEAE—MADDER FAMILY

Herbaceous or woody plants; leaves deciduous, simple, opposite, entire, connected by interposed stipules, or in whorls without apparent stipules; flowers perfect, but often appearing in two forms, regular; calyx-tube adherent to the ovary which is 2-4 celled; stamens 4-5, inserted on the tube of the regular corolla, equal in number to and alternate with its lobes; ovary 1-10 celled, inferior; style short or elongated; fruit various.

A very large family, only one genus of which with woody plants occurs in Michigan.

Cephalanthus L.—BUTTONBUSHES

Cephalanthus occidentalis L. (Common Buttonbush, Honey Balls). Fig. 140. A large spreading shrub, 1-3 m. high; bark dark-gray, mostly furrowed; branches glabrous; leaves simple, deciduous, entire, opposite or in whorls of 3, ovate, oval or lanceolate, mostly narrowed at the base, acuminate at the apex, glabrous both sides, or sometimes sparingly pubescent beneath, 7-14 cm. long, 4-6 cm. wide; petiole 1-2 cm. long; inflorescence axillary and terminal; peduncles 2-8 cm. long; heads globose, 2-4 cm. in diameter; flowers white, sessile and closely crowded, the receptacle pubescent; calyx-tube inversely pyramidal, 4-toothed, longer than the ovary, persistent; corolla tubular-funnel-form with 4 short lobes; stamens 4, inserted on the throat of the corolla; style slender and about twice as long as the ovary; fruit small, dry, 1-2 seeded. Flowers, July, August; fruit, September, October.



The Buttonbush grows in swamps and along streams. It is found from New Brunswick to western Ontario and California, south to Florida, Texas and Arizona. Michigan, Lower Peninsula, more abundant southward.

The Buttonbush is found growing in many low places no matter how small their area, where it can have water about its roots at least a part of the season. The flowers form a perfect globe with the thread-like styles protruding from every side and are the shrub's chief attraction. There are about 200 in each head, every one full of nectar and so attractive to bees that one of its common names is Honey Balls.

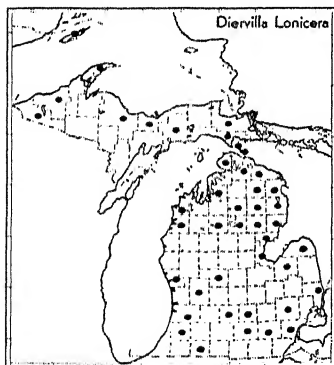
CAPRIFOLIACEAE—HONEYSUCKLE FAMILY

Shrubs, trees, vines or perennial herbs; leaves deciduous, opposite, simple or pinnately compound; stipules none, or sometimes present; flowers perfect and mostly cymose; calyx-tube adherent to the 2-5-celled ovary, its limb 3-5-toothed or lobed; corolla with the petals more or less united, the limb 5-lobed, or 2-lipped; stamens 5 (rarely 4), inserted on the tube of the corolla and alternate with its lobes; ovary inferior, 1-6-celled; style slender; stigma capitate, or 2-5-lobed; fruit a 1-6-celled berry, drupe or capsule; seeds oblong, globose or angular.

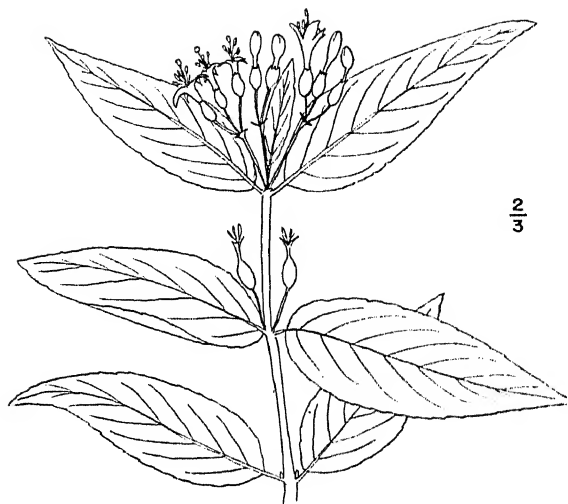
The following genera of this family include shrubs which are found in Michigan.

1. Leaves simple
 2. Flowers in pairs or few-flowered racemes; fruit a berry or capsule
 3. Leaves serrate; fruit a capsule.....*Diervilla*, p. 209
 3. Leaves not serrate; fruit a berry
 4. Mostly vines; corolla long-campanulate, 2-lipped, irregular.....*Lonicera*, p. 211
 4. Mostly low shrubs; corolla short-campanulate, regular.....*Symphoricarpos*, p. 219
 2. Flowers in compound cymes; corolla rotate, small; fruit a 1-seeded drupe.....*Viburnum*, p. 221
1. Leaves compound; flowers white, in compound cymes.....*Sambucus*, p. 231

Diervilla [Tourn.] Mill.—BUSH HONEYSUCKLES



Diervilla Lonicera Mill. (Bush Honeysuckle). Fig. 141. Low, upright shrubs, mostly less than 1 m. high; bark grayish-brown, shreddy when old; twigs glabrous or hispid in 2 lines; leaves deciduous, opposite, simple, ovate or ovate-lanceolate, glabrous except on the veins, finely serrate and ciliate, 6-13 cm. long, 2-5 cm. wide, long-acuminate at the apex, wedge-shaped to rounded at the base; petiole 5-10 mm. long, ciliate; flowers terminal or axillary in clusters of 2-6; calyx-tube slender; sepals bristle-like, about 5 mm. long; corolla light yellow, turning reddish, 10-15 mm. long, tubular or funnel-shaped, slightly gibbous at the base,



DIERVILLA LONICERA

FIG. 141



LONICERA CAERULEA VAR. VILLOSA

FIG. 142

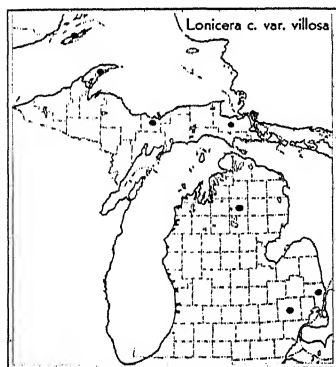
5-lobed; stamens 5, borne on the corolla-tube; ovary inferior, 2-celled; style long and slender; stigma capitate; fruit a slender, pointed pod, 7-10 mm. long with a beak half as long terminated with 5 persistent linear sepals; seeds numerous, small. Flowers, June, August; fruit, September, October.

Dry woods and rocky places Newfoundland to Manitoba, south to North Carolina and in the Great Lakes region. Michigan, common throughout.

Lonicera L.—HONEYSUCKLES

1. Upright bushy shrubs; leaves all distinct; flowers in pairs on axillary branches; calyx-teeth not persistent on the fruit
 2. Bracts of the peduncles subulate, linear, minute or none
 3. Corolla-lobes subequal
 4. Peduncles short, 3-7 mm. long; leaves oval, downy when young; fruit blue.....*L. caerulea* var. *villosa*, p. 211
 4. Peduncles long and slender, 1.4-3 cm. long; leaves ovate-oblong, downy when young, ciliate; fruit red.....*L. canadensis*, p. 213
 3. Corolla-lobes strongly 2-lipped; leaves tapering at the base, glabrous or nearly so; fruit red or purplish.....*L. oblongifolia*, p. 213
 2. Bracts of the peduncle broad, foliaceous; leaves ovate-oblong, 0.5-1.5 dm. long; fruit dark-purple.....*L. involucrata*, p. 215
1. Trailing or twining shrubs; leaves often connate-perfoliate; flowers in sessile whorled clusters or interrupted spikes; calyx-teeth persistent on the fruit
 5. Leaves pubescent, at least beneath; corolla yellow
 6. Branches glandular-villous; leaves pubescent on both sides, ciliate; corolla slightly gibbous at base.....*L. hirsuta*, p. 215
 6. Branches glabrous; leaves glabrous above, decidedly pubescent beneath; corolla strongly gibbous at base.....*L. glaucescens*, p. 217
 5. Leaves glabrous on both sides, 5-10 cm. long, very glaucous beneath; corolla greenish-yellow, the tube somewhat gibbous.....*L. dioica*, p. 217

Lonicera caerulea L. var. *villosa* (Michx.) T. & G. (Mountain Fly Honeysuckle). Fig. 142. Low erect shrub, up to 1 m. in height; bark shreddy, brown;



leaves simple, deciduous, opposite, oval, narrow, downy when young, 2-4 cm. long, 8-16 mm. wide, rounded or obtusely angled at the apex, mostly mucronate, base rounded, dark-green above, more or less pubescent, or nearly glabrate, pale below, veins prominent and reticulate, margin ciliate; petioles very short, villous; flowers 2 together in the axils of the lower leaves; bracts at the base of the ovaries small, lance-oblong; peduncles 2-7 mm. long, villous; calyx-lobes glabrous, border slightly 5-toothed; corolla pale yellow, narrowly bell-shaped, the outside mostly glabrous, villous inside, the tube slightly gibbous at the base, 7-8 mm. long, lobes nearly equal; stamens exserted; fruit a bluish-black

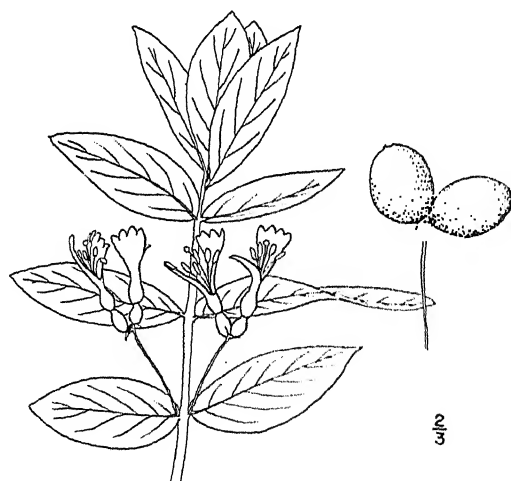
edible oval berry formed by the uniting of the ovaries of the two flowers, the scars of which are borne at the summit; seeds several. Flowers, May, June; fruit ripe July, August.

Low woods and bogs Labrador to Alaska, south to Pennsylvania, Michigan,



LONICERA CANADENSIS

FIG. 143



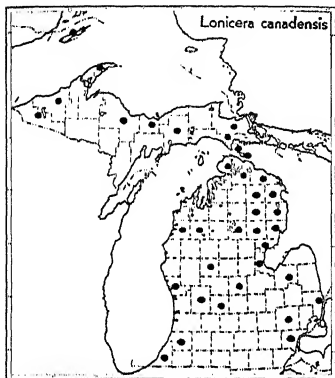
LONICERA OBLONGIFOLIA

FIG. 144

Wisconsin and west to California. Michigan, infrequent throughout.

The Mountain Fly Honeysuckle has the rather unusual characteristic that it produces two perfect flowers in order to make one berry. After the flowers have fallen the two ovaries enlarge and begin to grow toward each other, finally uniting into a single berry, which shows its double origin by the two so-called "eyes," each of which is the remnant of a flower calyx. It is a satisfactory shrub in cultivation.

Lonicera canadensis Marsh. (American Fly Honeysuckle). Fig. 143. A shrub with straggling branches, 1-1.5 m. in height; branchlets glabrous; leaves



simple, opposite, deciduous, ovate-oblong, often heart-shaped at the base, acute or acutish at the apex, villous-pubescent beneath when young, glabrous or nearly so when mature, 2-9 cm. long, 1.5-4 cm. wide, margins ciliate; petioles 4-6 mm. long, very slender; flowers in pairs on long filiform peduncles from the axils of the lower leaves; bracts very small; calyx margin obscurely lobed; corolla funnel-form, about 2 cm. long, greenish-yellow, the lobes much shorter than the tube which is gibbous at the base, glabrous without, slightly hairy within; stamens included; berries separate, reddish; seeds usually 3-4. Flowers, April, June; fruit, July, September.

In moist woods from New Brunswick to Manitoba, south to Connecticut and west to Pennsylvania and Michigan. Michigan, frequent throughout.

Lonicera oblongifolia (Goldie.) Hook. (Swamp Fly Honeysuckle). Fig. 144. Shrub 5-15 dm. high; branches upright; bark grayish; leaves simple, oppo-



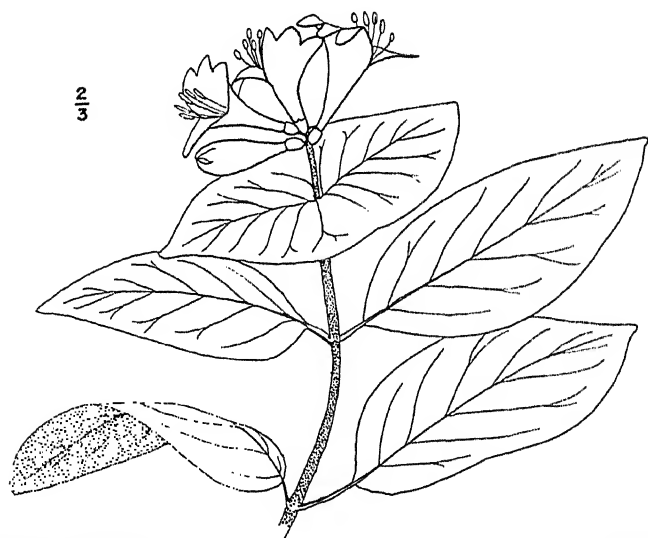
sitive, deciduous, 2-7 cm. long, 1-3.5 cm. wide, oblong, downy when young, glabrous in maturity, dark green above, pale beneath, apex acute or obtuse, base tapering; petioles very short; flowers in pairs on slender peduncles, 1-3 cm. long, from the axils of the lower leaves; bracts very small or none; calyx obscurely 5-lobed; corolla deeply 2-lipped, 1-1.5 cm. long yellowish-white, often purplish within, more or less hairy, gibbous at base; stamens exserted; filaments hairy; fruit red or purplish, the berries united or nearly distinct. Flowers, May, July; fruit, August, September.

Tamarack and arbor vitae swamps Quebec to Manitoba, Vermont, New York, Pennsylvania, Michigan and Minnesota. Michigan, frequent except in the extreme southern counties.



LONICERA INVOLUCRATA

FIG. 145



LONICERA HIRSUTA

FIG. 146

Lonicera involucrata (Richards.) Banks. (Involucrated Fly Honeysuckle). Fig. 145. Shrub, 1-3 m. high, pubescent or becoming glabrous; branches 4-



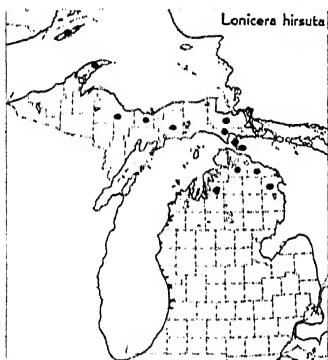
angled; leaves simple, opposite, deciduous, ovate, oval or obovate, 5-15 cm. long, acute or acuminate at the apex, narrowed or rounded at the base, more or less pubescent when young, midrib prominent; petioles short; flowers borne on axillary peduncles, 2-5 cm. long, 2-3 flowered; bracts foliaceous, ovate or oval, often cordate; bractlets also large and at length surrounding the fruit; flowers yellow; calyx-teeth very short; corolla funnel-form, 1-1.5 cm. long, viscid-pubescent, the border with 5 short, nearly equal little-spreading lobes; stamens 5, slightly exserted; style slender, as long as the stamens; berries distinct, globose or oval, nearly black, about 8 mm. in diameter. Flowers June, July; fruit

ripe August, September.

In woodlands, banks of streams New Brunswick and Quebec to western Ontario and Michigan, west to British Columbia and Alaska, south to Utah and California. Michigan, reported from Washtenaw, Macomb and Keweenaw Counties.

See remarks regarding this honeysuckle in section on Rare Species.

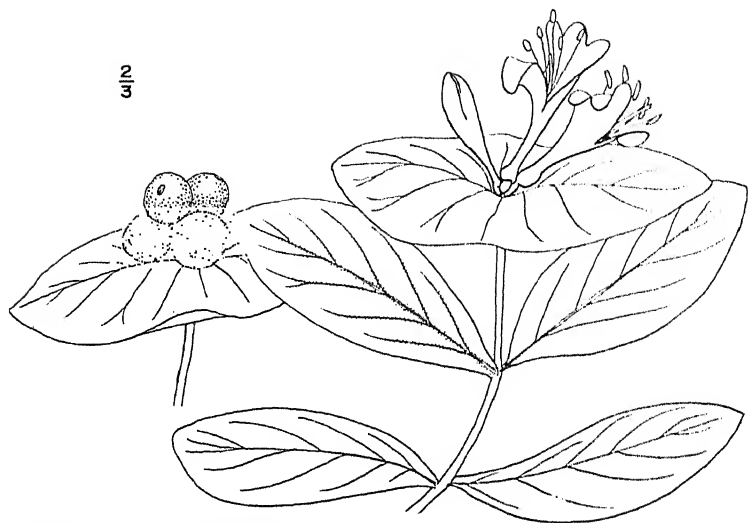
Lonicera hirsuta Eat. (Hairy Honeysuckle). Fig. 146. Twining and rather high-climbing vine; branches hirsute-pubescent; leaves simple, opposite, decid-



uous, broadly oval, the uppermost united forming a rhombic or nearly orbicular disk, the lower short-petioled, 5-11 cm. long, 3.5-8 cm. wide, upper surface dark-green and appressed pubescent, pale below, downy-pubescent, margin ciliate; flowers in approximate whorls in short terminal interrupted spikes; peduncles hirsute and glandular; calyx-teeth minute, persistent on the fruit; corolla 2-2.5 cm. long, orange-yellow, clammy-pubescent within and without, slender, somewhat gibbous at base, the limb 2-lipped, about as long as the tube; stamens and style strongly exserted, somewhat hairy below; fruit a red berry. Flowers, July; fruit, September.

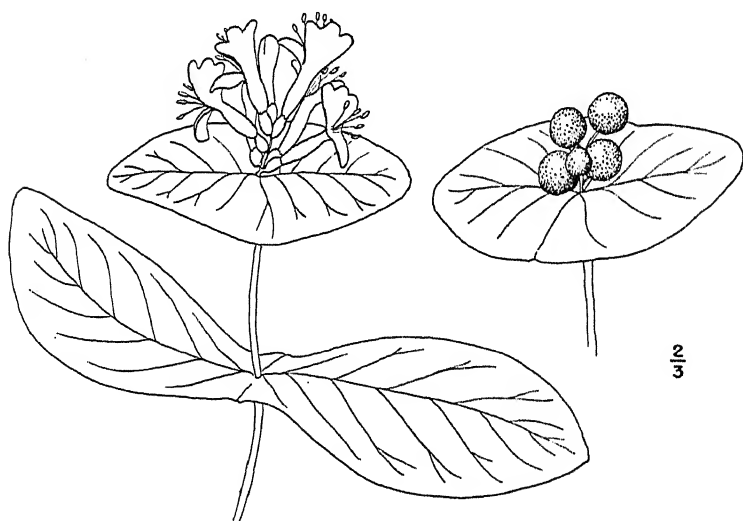
Woodlands Vermont and Ontario to Manitoba, Pennsylvania, Ohio and Michigan. Michigan, frequent upper part of Lower Peninsula and in the Upper Peninsula.

This honeysuckle appears to prefer coniferous woods, as it is only found in the upper portion of the Lower Peninsula and in the Upper Peninsula.



LONICERA GLAUDESCENS

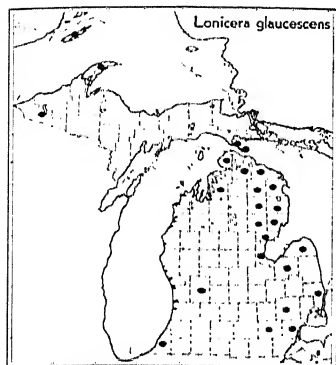
FIG. 147



LONICERA DIOICA

FIG. 148

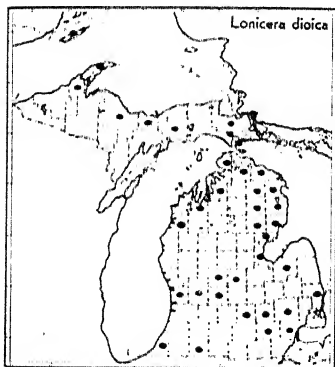
Lonicera glaucescens Rydb. (Douglas' Honeysuckle). Fig. 147. Twining, climbing vine, in habit similar to the preceding; branches glabrous; leaves simple, opposite, deciduous, 3-9 cm. long, glabrous above, decidedly pubescent beneath, at least on the veins, margin not ciliate, usually only the upper pair connate-perfoliate; flowers verticillate in a short terminal interrupted spike; corolla pale yellow, changing to reddish, 1.2-2 cm. long, pubescent or puberulent without, pubescent within, the 2-lipped limb shorter than the tube which is gibbous at the base; stamens somewhat pubescent or nearly glabrous; style hirsute; both exserted; ovary sometimes hirsute; berry salmon-color; seeds about 3. Flowers, May, June; fruit, August, September.



infrequent throughout.

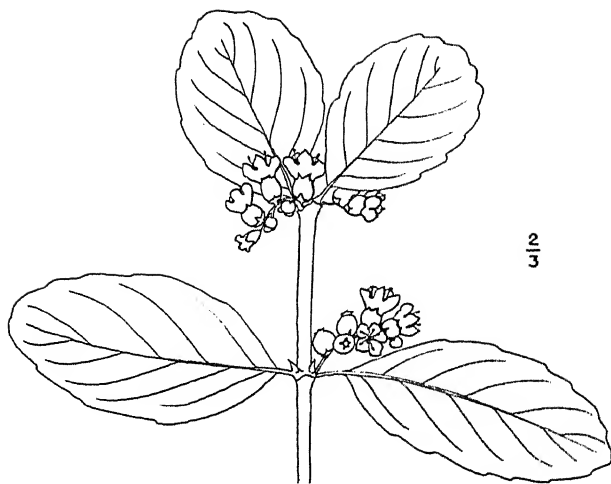
The twining honeysuckles are exceedingly variable and as a result the nomenclature is sadly mixed. Some authors do not recognize Douglas' Honeysuckle as a separate species, but treat it as a variety of *L. dioica* L.; others separate a variety which still others call a form of the variety. These are difficult of determination and in order not to be more confusing than necessary they have been omitted here.

Lonicera dioica L. (Smooth-leaved Honeysuckle, Glaucous Honeysuckle). Fig. 148. Twining shrubs, 1-3 m. long; branches glabrous; leaves simple, oppo-



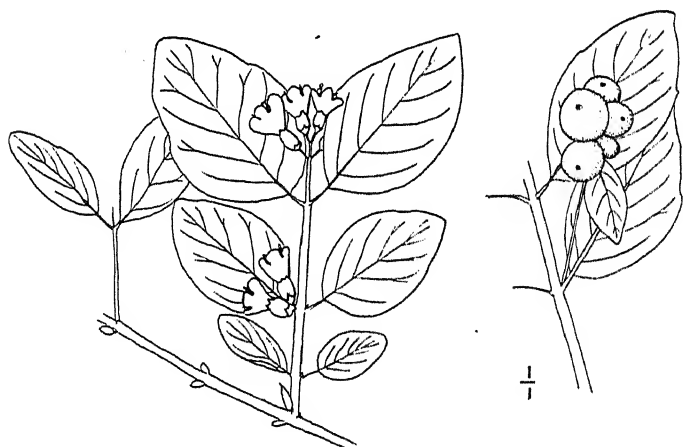
sitive, deciduous, glaucous and glabrous beneath, 3-8 cm. long, up to 4 cm. wide, the upper 1-4 pairs connate into disks of which even the upper are oblong or rhombic, more or less pointed at each end, the lower sessile or short-petioled and narrower, margin entire; flowers several in a cluster at the end of the branchlets; peduncle up to 2 cm. long; corolla with a 2-lipped limb, greenish-yellow or purplish, the tube barely 1 cm. long, pubescent within, gibbous at base; stamens and style hairy, exserted; fruit salmon-color; seeds usually 3. Flowers, May, June; fruit, July, September.

Rocky grounds and dry situations Quebec to Manitoba, south to North Carolina, Ohio and Missouri. Michigan, common throughout.



SYMPHORICARPOS OCCIDENTALIS

FIG. 149



SYMPHORICARPOS RACEMOSUS

FIG. 150

Symphoricarpos [Dill.] Ludwig.—SNOWBERRIES

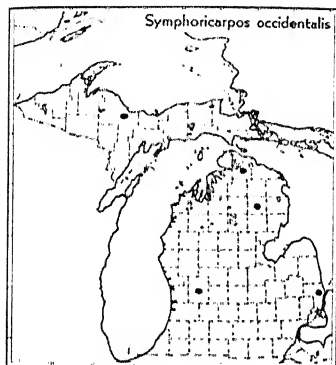
Flowers sessile in several-flowered axillary and terminal spikes;
stamens and styles exserted.....

...*S. occidentalis*

Flowers short-pedicelled, spikes few-flowered;
stamens and styles not exserted.....

...*S. racemosus*

Symphoricarpos occidentalis Hook. (Wolfberry). Fig. 149. An erect free-branching shrub, glabrous or nearly so, 3-10 dm. high; twigs puberulent, reddish-brown, slender; leaves simple, opposite, deciduous, thickish, ovate, entire or wavy-toothed, 2-10 cm. long, 1.5-7 cm. wide, more or less pubescent beneath, rounded or narrowed at the base, apex acute or rounded, mucronate, dark-green above, paler green below; petioles pubescent, up to 10 mm. long; flowers in dense terminal and axillary spikes; calyx-tube short, 5-toothed, regular, persistent; corolla pinkish, funnel-form, much bearded within, 6-9 mm. long, lobed to beyond the middle; stamens exserted; style exserted, glabrous; fruit a 2-seeded berry, dull white, turning blackish; seeds straw-colored, smooth. Flowers, July; fruit ripe September.

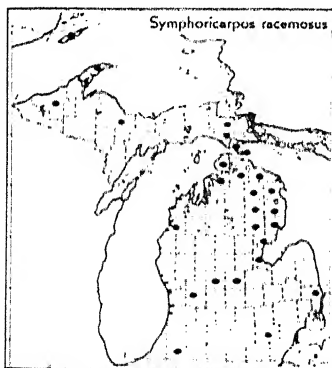


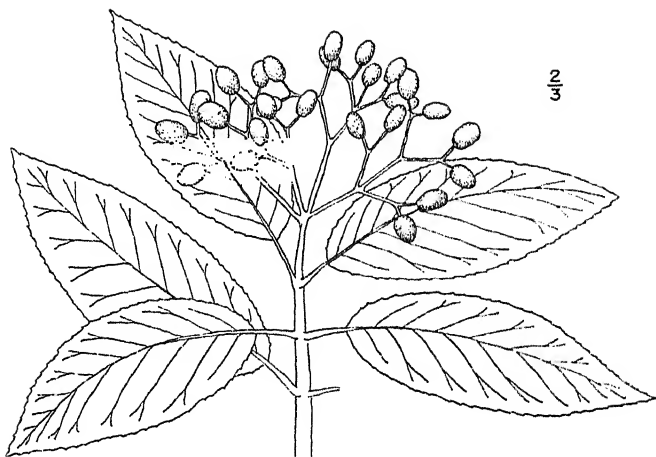
Rocky ground northern Michigan and Illinois to Kansas, west to the Rocky Mountains. Michigan, rare middle and upper portion of Lower Peninsula and Upper Peninsula.

The Wolfberry spreads freely by the root and often forms dense colonies. Its fruit frequently remains on the stems throughout the winter.

Symphoricarpos racemosus Michx. (Snowberry). Fig. 150. Erect shrub, glabrous or nearly so, 2-10 dm. high; twigs slender, light brown; bark on older branches gray, turning darker in age; leaves simple, opposite, deciduous, elliptic-oblong to orbicular, 2-5 cm. long, 1-3 cm. wide, thin, green both sides, sometimes pilose or whitened beneath, margin entire, ciliate; petioles about 4 mm. long; flowers on short pedicels, 1-2 in the axils, or in short interrupted spikes at the ends of the branches; calyx 5-toothed, the sepals more or less ciliate; corolla campanulate, about 6 mm. long, pink and white, bearded inside, somewhat gibbous at the base; stamens and the glabrous style included; berry snow-white, globose, about 6 mm. in diameter, with a remnant of the style appearing as a black spot; seeds 2, slightly roughened. Flowers,

June, July; fruit ripe September, October, November.





VIBURNUM CASSINOIDES

FIG. 157



VIBURNUM LENTAGO

FIG. 158

Dry, rocky places and banks Nova Scotia and Quebec to British Columbia, south to Pennsylvania, Kentucky, Minnesota, South Dakota, Montana and California. Michigan, infrequent throughout.

The nomenclature of the Snowberry is sadly mixed and should be studied and stabilized. In 'Gray's Manual', two varieties of it are recognized, which are given in 'Beal's Michigan Flora' as species. It has even been taken from the Honeysuckle family and included among the vacciniums of the Heath family as a white huckleberry. For the sake of simplicity all varieties are omitted here. It is likely that if an extensive enough series could be collected and studied it would be found that they intergrade to an extent which would include them all as one species, or compel the naming of each individual plant as a separate form.

Viburnum [Tourn.] L.—ARROW-WOODS, VIBURNUMS

1. Cymes with the outer flowers large and showy
 2. Leaves pinnately veined, not lobed; drupe red.....*V. alnifolium*, p. 221
 2. Leaves palmately veined, 3-lobed; drupe red.....*V. Opulus* var. *americanum*, p. 223
1. Cymes with all the flowers small and uniform
 3. Leaves mostly 3-lobed and palmately veined
 4. Leaves glabrous; cymes 1-2.5 cm. broad, the rays short; drupe red.....*V. pauciflorum*, p. 225
 4. Leaves soft-downy; cymes 3.5-6 cm. broad, the rays slender; drupe purple-black.....*V. acerifolium*, p. 225
 3. Leaves not lobed, pinnately veined
 5. Leaves coarsely dentate; veins prominent below
 6. Petioles very short; leaves pubescent.....*V. pubescens*, p. 227
 6. Petioles 6-25 mm. long; leaves glabrous, or with hairy tufts in the axils beneath.....*V. dentatum*, p. 227
 5. Leaves finely toothed; veins not prominent
 7. Cymes with peduncles 1-2 cm. long.....*V. cassinoides*, p. 229
 7. Cymes sessile, or nearly so
 8. Petioles with a broad and wavy margin; leaves acuminate.....*V. Lentago*, p. 229
 8. Petioles not wavy-margined; leaves rounded at apex or acute.....*V. prunifolium*, p. 229

Viburnum alnifolium Marsh. (Hobble-bush, Witch Hobble, Moosewood).

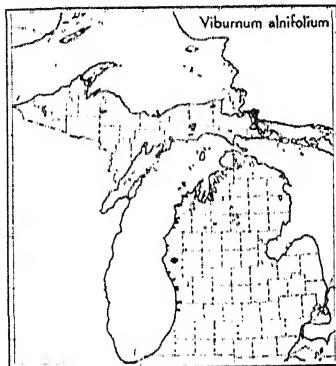


Fig. 151. A low irregular, straggling shrub; bark on older stems smooth, purplish; twigs densely covered with a rusty-scurfy pubescence; branches often procumbent and rooting at the tips; leaves deciduous, opposite, simple, round-ovate, 1-2 dm. across, cordate at the base, abruptly pointed at the apex, finely serrate all around, strongly pinnately veined, covered with dense, rusty down both sides when young, at length glabrous and deeply corrugated above, scurfy with stellate pubescence on the veins beneath; petioles 1-3 cm. long; flowers of 2 sorts, perfect and neutral, all white and borne in sessile, usually 5-rayed cymes, 7-13 cm. broad, the mar-



VIBURNUM PAUCIFLORUM

FIG. 153



VIBURNUM ACERIFOLIUM

FIG. 154

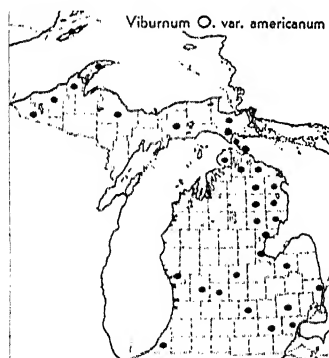
ginal without stamens and pistil, about 2 cm. broad and raised on long pedicels, the inner small and perfect; calyx 5-toothed; corolla rotate, 5-lobed, the lobes spreading; stamens 5, exserted; style short; stigmas 3-parted; drupe ovoid-oblong, red, becoming purple, 10-12 mm. long; stone 3-grooved on one side; 1-grooved on the other. Flowers, May, June; fruit, September.

In low woods New Brunswick to North Carolina, Tennessee, Ontario, western New York and Michigan. Michigan, definitely reported only from Oceana County in Lower Peninsula. See comments under Rare Species.

It is interesting to speculate upon the reason for some of the common names applied to the Hobble-bush. It is a straggling shrub and the long branches often take root at the end. In woods where it is abundant these loops catch the feet of the unwary, tripping them up. It is not hard to see where it would get the name Trip-toe from this character, as well as Hobble-bush, or Witch Hobble.

This viburnum is interesting in both flower and fruit. The large neutral flowers are very effective in combination with the leaves, while the fruit in its change of color through coral and crimson to purple is equally attractive.

Viburnum Opulus L. var. *americanum* (Mill.) Ait. (High-bush Cranberry, Cranberry-tree). Fig. 152. A shrub 1-4 m. high, with upright smooth

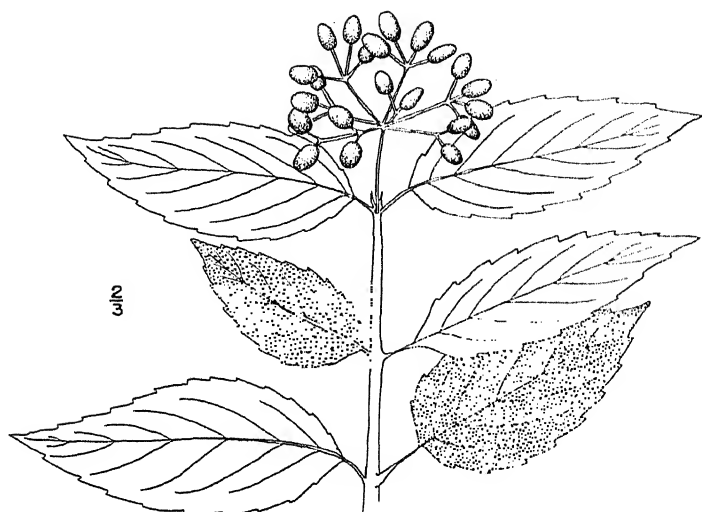


gray branches; twigs glabrous; leaves opposite, simple, deciduous, 3-5 ribbed, strongly 3-lobed, broadly wedge-shaped, rounded, or slightly cordate at the base, the lobes spreading and sharply pointed, mostly dentate on the sides, entire in the sinuses, 3.5-10 cm. long, 3.5-12 cm. wide, more or less pubescent on both surfaces or becoming almost glabrous; petioles 1-2.5 cm. long, bearing two glands at the apex; cymes flat-topped, 5-10 cm. in diameter; peduncles 1-3.5 cm. long; flowers white, the outer row sterile, about 2 cm. broad; corolla rotate, deeply 5-lobed; the inner fertile about 4 mm. broad; calyx attached to the ovary, border 5-toothed; stamens 5, elongate; stigma 3-

parted; drupe globose or ellipsoid about 10 mm. in diameter, red, sour and bitter; stone orbicular, flat, not grooved. Flowers, May, June; fruit ripe September.

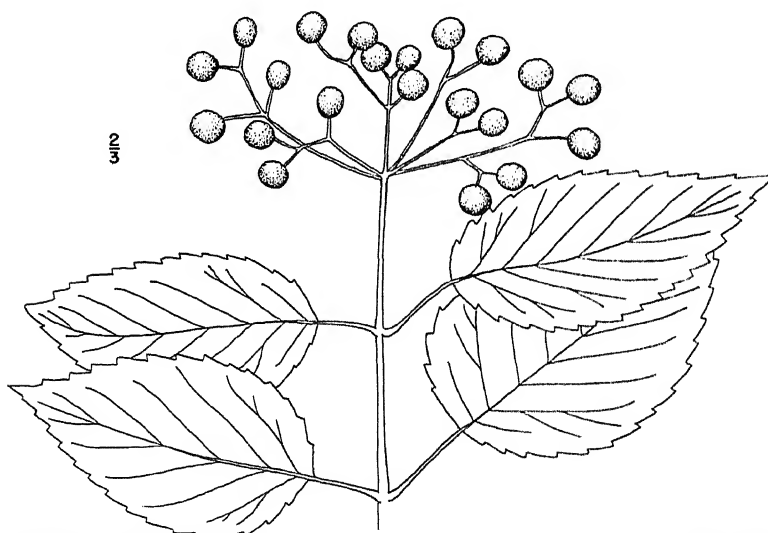
In low grounds Newfoundland to British Columbia, south to New Jersey, Pennsylvania, Michigan, Indiana, Wisconsin and South Dakota. Michigan, common throughout.

The High-bush Cranberry is a familiar shrub in low grounds throughout Michigan. Although it is very interesting when in bloom because of having two sorts of flowers in its clusters, its greatest beauty comes in the fall when the fruit has ripened and the leaves turned a brilliant scarlet. The berries often remain on the branches through the winter. They are acid and bitter, but make an acceptable substitute for cranberries when cooked and are frequently used for jelly.



VIBURNUM PUBESCENS

FIG. 155

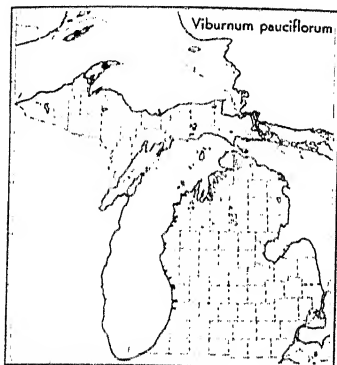


VIBURNUM DENTATUM

FIG. 156

Viburnum Opulus L., the European species, is the parent of the common Snow-ball Tree of our gardens. In the cultivated state the whole cyme is turned into showy sterile flowers.

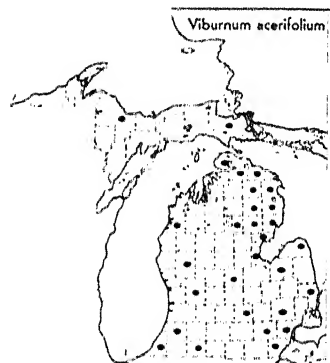
Viburnum pauciflorum Raf. (Squashberry). Fig. 153. A straggling shrub 0.6-1.8 m. high; bark grayish on



the older stems; young twigs reddish-brown, glabrous or nearly so; leaves simple, opposite, deciduous, broadly oval, obovate, or broader than long, 5-ribbed, rounded or semiheart-shaped at the base, the summit with 3 shallow lobes coarsely and unequally dentate, glabrous above, pubescent on the veins beneath, 3-8 cm. broad; petiole 1-2 cm. long; cymes peduncled, few-flowered, about 2 cm. broad; flowers white, all perfect, small and uniform; calyx 5-toothed; corolla spreading, deeply 5-lobed; stamens 5, shorter than the corolla; stigmas 1-3; drupe ovoid or globose, light red, acid, 8-10 mm. long; stone flat, orbicular, not grooved. Flowers, June; fruit, August, September.

Cold woods Newfoundland to Alaska, south to Maine and New Hampshire, Pennsylvania, northern Michigan, Minnesota, Colorado and Washington. Michigan, Upper Peninsula only, rare.

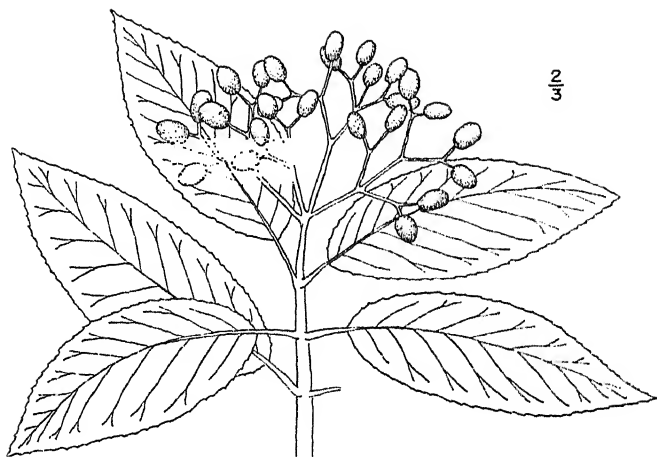
Viburnum acerifolium L. (Mapleleaf Viburnum). Fig. 154. A shrub 1-1.5 m. high; branchlets pubescent; leaves opposite, simple, deciduous, ovate, orbicular or sometimes broader than long, cordate



or truncate at base, 3-lobed, 5-14 cm. long, coarsely and unequally dentate, lobes divergent, acuminate at the apex, pubescent on both sides; petioles 1-3 cm. long, downy; stipules bristle-form; flowers perfect, cream-white, in 3-7 rayed pedunculate, pubescent cymes, 4-7 cm. broad; calyx with 5 obtuse teeth; corolla wheel-shaped, 4-6 mm. broad; stamens 5, exserted; style 3-lobed; drupe deep purple-black, globose, 8-9 mm. in diameter; stone lenticular, faintly 2-ridged on one side, 2-grooved on the other. Flowers, May, June; fruit ripe September.

Rocky woods New Brunswick to Michigan, Minnesota, Kentucky and Georgia. Michigan, throughout, but more common Lower Peninsula.

The Mapleleaf Viburnum appears to thrive best in deep shade and is a familiar little shrub in our deciduous woods. Its fruit remains on the branches most of the winter.



VIBURNUM CASSINOIDES

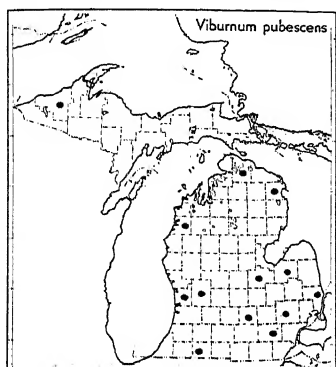
FIG. 157



VIBURNUM LENTAGO

FIG. 158

Viburnum pubescens (Ait.) Pursh. (Downy Arrow-wood). Fig. 155. A low shrub, 1-1.5 m. high; bark



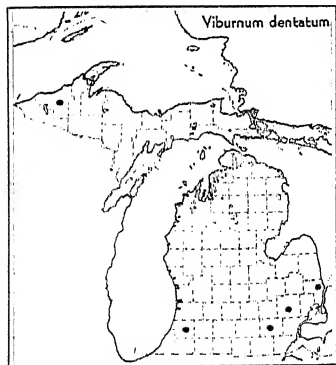
gray; twigs brownish, glabrous or sometimes slightly pubescent; leaves opposite, simple, deciduous, ovate or oblong-ovate, 4-8 cm. long, 1.5-4.5 cm. wide, rounded or slightly cordate at the base, acute or taper-pointed at the apex, margin coarsely and irregularly dentate, glabrous above, densely velvety-pubescent below, or sometimes glabrate on the surfaces; petioles very short, soft-downy when young; cymes peduncled with mostly 7 rays about 1 cm. long, 3-7 cm. broad, numerous; flowers perfect, white; calyx-border 5-toothed, acute; corolla rotate with 5 spreading lobes; stamens 5, exserted; style short, 3-lobed; drupe oval, nearly black, about 8 mm. long; stone slightly 2-grooved on both faces. Flowers, May, June; fruit

August, September.

In rocky woods and on ridges and banks Quebec and Ontario to Georgia, west to Michigan and Iowa. Michigan, common throughout.

The autumn coloring of this viburnum is very fine, varying from deep-purple to red.

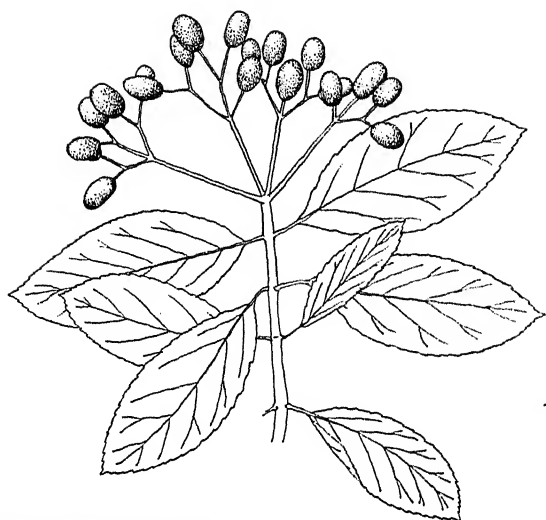
Viburnum dentatum L. (Arrow-wood). Fig. 156. A shrub 1-4.5 m. high, bark ash-colored, smooth; branches obtusely angular; leaves opposite, simple, deciduous, broadly oval or orbicular, 5-8 cm. long rounded or slightly cordate at the base, acute or short-acuminate at the apex, prominently veined, coarsely and sharply serrate, glabrous, or with hairy tufts in the axils of the veins beneath; petioles 0.5-3 cm. long; cymes flat, 5-8 cm. broad, long-peduncled; flowers perfect, white; calyx-limb 5-toothed; corolla wheel-shaped with 5 spreading lobes; stamens 5, exserted; style short, 3-lobed; fruit globose-ovoid, 6 mm. long, dark-blue, somewhat acid; stone grooved on 1 side, rounded on the other. Flowers, May, June; fruit, August, September.



Found in low moist places New Brunswick to Ontario, Georgia, Michigan and Minnesota. Michigan, infrequent throughout.

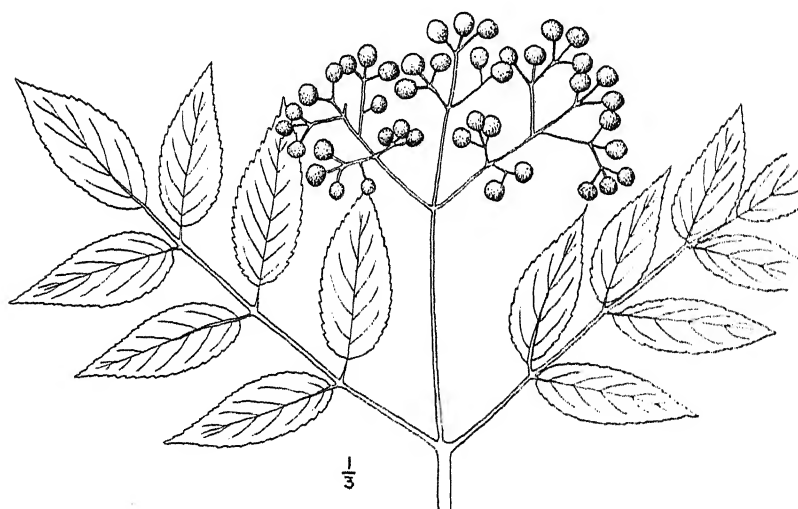
The Arrow-wood takes kindly to cultivation and is extensively planted. It is a most attractive shrub both in flower and in fruit. The young shoots are slender and very straight and are said to have been generally used by the Indians for arrows, which fact gives rise to its common name.

[227]



VIBURNUM PRUNIFOLIUM

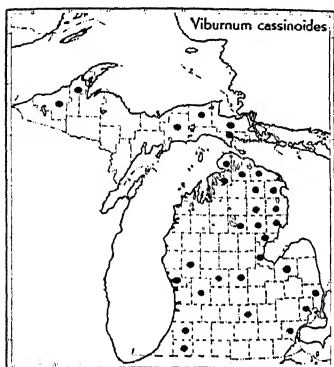
FIG. 159



SAMBUCUS CANADENSIS

FIG. 160

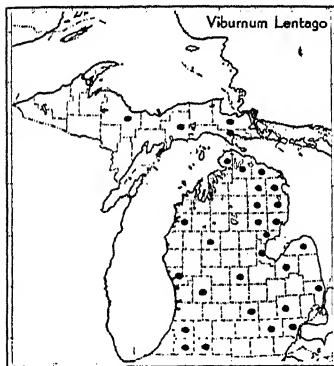
Viburnum cassinoides L. (Withe-rod, Wild Raisin). Fig. 157. Erect shrub 0.5-3 m. high; branches gray; branchlets scurfy or sometimes glabrous; leaves opposite, simple, deciduous, thickish and dull, ovate to oblong, 2.5-10 cm. long, obscurely veined, narrowed or rounded at the base, acute or rounded at the apex, margins irregularly crenulate-denticulate or sometimes entire, young leaves scurfy, soon becoming glabrous or nearly so; petioles 6-10 cm. long; flowers perfect, white, borne in broad, flat, usually 5-rayed peduncled cymes up to 8 cm. in diameter; calyx-border 5-toothed; corolla rotate with 5 spreading lobes; stamens 5, exserted; style short, 3-lobed; drupe ellipsoid to spherical, 6-9 mm. long, blue-black with a bloom when ripe; stone round or oval, flattened. Flowers, June, July; fruit ripe September.



In swamps and wet soil New Brunswick to Manitoba, New Jersey, Georgia, Wisconsin, Minnesota and Alabama. Michigan, frequent throughout.

This viburnum is easily cultivated and becomes a compact symmetrical shrub, an ornament to any garden.

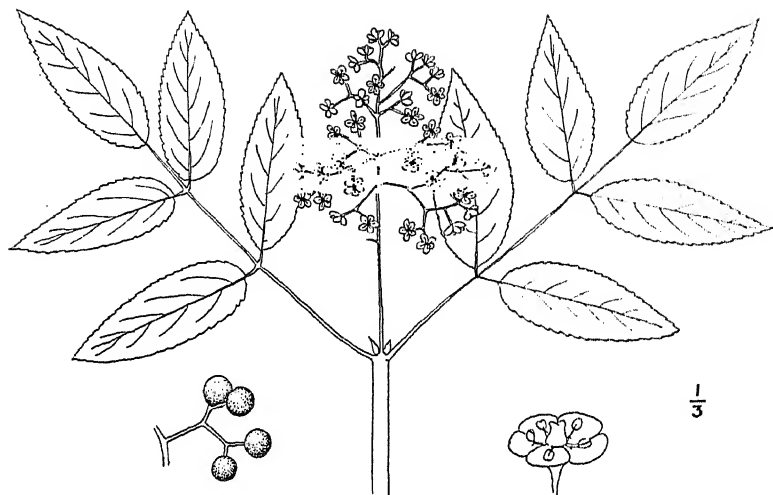
Viburnum Lentago L. (Nanny-berry, Sheepberry, Sweet Viburnum). Fig. 158. A shrub or small tree, 2-6 m. high; twigs glabrous; leaves simple, opposite, deciduous, ovate or oval, rounded at base, acuminate at the apex, 5-10 cm. long, glabrous on both sides, closely and very sharply serrate; petioles 1-2.5 cm. long, often winged and wavy-margined; cymes sessile, 3-4 rayed, 6-10 cm. broad; flowers perfect, white, 6-7 mm. broad; calyx 5-toothed; corolla rotate, 5-lobed; stamens 5, exserted about half their length; style short, 3-parted; drupe ovoid or ellipsoid, bluish-black, 10-12 mm. long; stone oval to oblong, flat and smooth. Flowers, May, June; fruit September.



Michigan, frequent throughout.

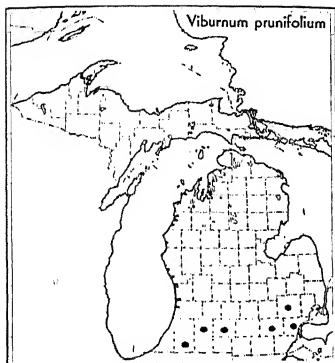
This viburnum is valuable for ornamental planting and does well in cultivation. Its fruit is variable and an extreme form with spherical drupes has been separated as var. *sphaerocarpum* Gray. The fruit is edible.

Viburnum prunifolium L. (Black Haw). Fig. 159. Shrub or small tree; bark furrowed, reddish-brown on older stems; leaves simple, opposite, decid-



SAMBUCUS RACEMOSA

FIG. 161



uous, ovate or broadly oval, obtuse or slightly pointed, 2-8 cm. long, narrowed at the base, finely serrulate, at length glabrous or nearly so; petioles glabrous, slender or slightly winged; cymes sessile, 3-5 rayed, 5-10 cm. broad; flowers numerous, perfect, white, expanding with, or a little before the leaves, about 5 mm. in diameter; calyx 5-toothed; corolla spreading, deeply 5-lobed; stamens 5, exserted; style short, 3-parted; drupe ellipsoid, ovoid or nearly globose, 1-1.4 cm. long, blue-black with a bloom; stone oval, flat on one side, convex on the other. Flowers, May, June; fruit ripe September and October.

The Black Haw is found in dry soil Connecticut to Georgia, west to Michigan, Kansas and Texas. Michigan, infrequent southern portion.

This viburnum is very variable in the shape of its leaves and fruit. A form with smaller globose fruit has been reported and named *globosum* Nash.

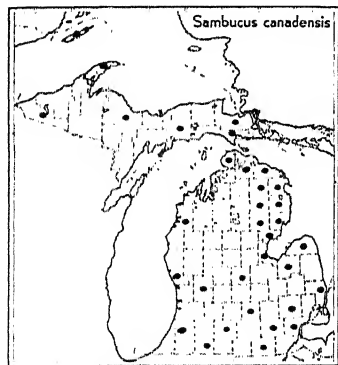
Sambucus [Tourn.] L.—ELDERBERRIES

Cymes flat, in midsummer; fruit black-purple, edible; pith white.....*S. canadensis*, p. 231

Cymes pyramidal, in early spring; fruit bright red,

inedible; pith brown.....*S. racemosa*, p. 232

Sambucus canadensis L. (Common Elder). Fig. 160. Shrub 1-3.5 m. high, glabrous or nearly so; stems with large white pith and grayish-brown bark, rank smelling when bruised; leaves opposite and deciduous, pinnately compound; leaflets 5-11, ovate to ovate-oblong or lanceolate, short-stalked, 7-15 cm. long, 3-6 cm. wide, mostly smooth or with slight pubescence on the veins beneath, the lower sometimes 3-parted, margins sharply serrate, occasionally with stipels; petiole 4-5 cm. long, stipules few; flowers white, 5-6 mm. wide in a terminal compound cyme, about 10-20 cm. broad; peduncles 6-12 cm. long; calyx-tube 3-5-lobed or toothed; corolla open-urn-shaped, regular, 3-5-lobed; stamens 5, inserted on the base of the corolla and reflexed with the petals; fruit globose, black, about 4 mm. in diameter, mature in early fall; seeds, 3-5,



roughened. Flowers, June, July; fruit ripe September, October.

Distributed from Nova Scotia to Florida, west to Manitoba and Texas. Michigan, common throughout.

The Common Elder prefers rich, moist ground and, as its name implies, is widespread and abundant. To many the elder is a nuisance, but there can be

little division of opinion as to the value of its fruit as food for the birds. The robins especially seem to be very fond of it. As for human consumption, elderberry pie is not at all bad. Elderberry wine is also made from the berries, and is said to have a decided medicinal value.

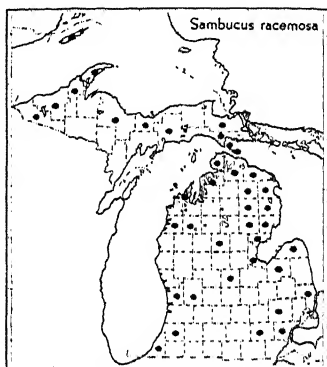
The native elder is not much used in ornamental planting, doubtless because it is so common and cheap. Many shrubs are used, however, the flowers of which do not equal in beauty the large cymes of the elder. It comes into bloom late in the season when most shrubs are through blooming, which is an added attraction.

Sambucus racemosa L. (Red-berried Elder). Fig. 161. A shrub 0.5-4 m. high; bark gray and warty; twigs usually pubescent, with dark-brown pith; leaves deciduous, opposite, odd-pinnate; leaflets 5-7, ovate-lanceolate, 4-13 cm. long, 2-4 cm. wide, downy underneath, serrate, base narrowed, rounded or sub-cordate, usually unequal, apex acute or acuminate; petiole 2.5-5 cm. long; flowers in convex or pyramidal paniced cymes, yellowish-white, 3-4 mm. broad; petals reflexed; stamens 5, short; stigmas nearly sessile; fruit ripening in June, bright red, berry 4-5 mm. in diameter, acid, inedible; seeds dark-brown, minutely roughened. Flowers, April, May; fruit, June, July.

Rocky woods, Newfoundland to British Columbia, south to Georgia, Michigan, Iowa, Colorado and California. Michigan, common throughout.

The Red-berried Elder like other members of the Honeysuckle Family has several botanical names. Some authors maintain that *S. racemosa* L. is the European species, and that *Sambucus pubens* Michx. is ours. However, as 'Gray's Manual' is being followed as to nomenclature *racemosa* is used here. Var. *laciniata* Koch. with leaflets divided into linear-lanceolate or laciniate segments may be looked for in the Lake Superior region of our state.

Our two native elders make an interesting team. The Red-berried is one of the earliest shrubs to bloom and its fruit is fully ripened before the Common Elder comes into flower in late summer. The fruit of the Common Elder ripens in the fall and remains until frost, so that between the two with flower and fruit they span the entire growing season from frost to frost.



Glossary

- Achene*. A dry 1-seeded fruit.
- Acuminate*. Gradually tapering to a long point.
- Acute*. Sharp-pointed.
- Adherent*. The union of parts usually separate.
- Adhesive*. Having the quality of sticking to.
- Adnate*. Grown to, united.
- Aerial*. Growing in the air.
- Alternate*. A single leaf at each node; not opposite.
- Angled*. The meeting of 2 planes to form an edge.
- Annular*. In the form of a ring.
- Anther*. The portion of the stamen containing the pollen.
- Apetalous*. Without petals.
- Apex*. Upper end or tip (of a leaf).
- Appendaged*. Having an addition or projection.
- Appressed*. Lying flat and close against.
- Arching*. Growing in a graceful curve, or arch.
- Aril*. A fleshy, often bright-colored appendage to a seed.
- Armed*. Bearing thorns, spines or prickles.
- Aromatic*. Having a spicy smell or taste.
- Ascending*. Growing upward at an angle, not perpendicular; upcurved.
- Attenuate*. Slenderly tapering, growing very narrow.
- Awl-shaped*. Attenuate from the base to a slender or rigid point.
- Awn*. A slender bristle-like appendage.
- Axil*. The angle formed by a leaf or branch with the stem.
- Axillary*. Situated in the axil of a leaf.
- Axis*. The central support of a group of organs, a stem, etc.
- Bark*. The covering of the stems, branches and roots of a shrub or tree.
- Base*. The lowest portion (as of a leaf).
- Beak*. An elongated, tapering structure.
- Beaked*. A projection ending in an elongated tip.
- Bearded*. Bearing long, stiff hairs.
- Berry*. A fleshy fruit having a thin skin or outer covering, the seeds surrounded by the pulp.
- Biennial*. Requiring two years to complete its life-cycle; growing one year, flowering and fruiting the next.
- Bipinnate*. When both primary and secondary divisions of a leaf are pinnate.
- Bladdery*. Thin and inflated.
- Blade*. The flat, expanded portion of a leaf.
- Bloom*. A fine powdery, waxy substance causing the glaucous appearance of certain fruits.
- Bract*. A small leaf subtending a flower or belonging to a flower cluster.
- Bracteate*. Having bracts.
- Bracteole*. A small bract or scale on the pedicel below the flower.
- Bractlet*. A secondary bract, as upon a flower pedicel.
- Branch*. A secondary stem of a shrub or tree, older than the current year.
- Branchlet*. The growth of the current year.
- Bristly*. Beset with long spines.
- Bud*. An undeveloped stem, branch or shoot; an unexpanded flower.
- Calyx*. The outer of the two series of flower envelopes, mostly green, but occasionally colored and petal-like.
- Campanulate*. Shaped like a bell.
- Cane*. The new shoots of certain shrubs, as the raspberries.
- Canescent*. Covered with gray, or hoary, fine pubescence.
- Capillary*. Fine, hair-like.
- Capitate*. Knob-like; arranged in a head, or dense cluster.
- Capsule*. A dry fruit of two or more carpels, usually opening by valves or teeth.
- Carpel*. A simple pistil, or one unit of a compound pistil.
- Catkin*. A scaly, spike-like inflorescence of small flowers, as the willow.
- Cell*. The cavity of an anther or ovary.
- Ciliate*. Having hairs on the margin.
- Ciliolate*. Minutely ciliate.
- Clammy*. Soft and sticky to the touch.
- Claw*. The very-much narrowed lower part of a petal.
- Cleft*. Cut about half-way to the middle.
- Cluster*. A group, or bunch, as of flowers or fruits.
- Coalescent*. Growing together, uniting.

Coherent. United or clinging together.

Column. The combination of parts into a solid central body.

Compact. Closely joined or pressed together.

Compound. Containing two or more similar parts united to make one whole, as a compound leaf, which is composed of several leaflets.

Compressed. Flattened.

Cone. A dry multiple fruit, composed of scales arranged around an axis and enclosing seeds, as a pine cone.

Conic. Cone-shaped.

Connate. Where like organs are more or less united.

Connivent. Coming into contact; converging.

Contiguous. When neighboring parts are in contact.

Convex. Having a more or less rounded surface.

Convolute. Rolled up longitudinally; rolled around.

Cordate. Shaped like a heart.

Coriaceous. With the texture of leather.

Corolla. The inner of the two series of floral envelopes, usually colored.

Corrugated. Wrinkled.

Corymb. A flat-topped or convex flower-cluster, the outer flowers opening first.

Corymbiform. In the form of a corymb.

Corymbose. Like a corymb, or borne in corymbs.

Creeping. Running along the ground and rooting at intervals.

Crenate. Having much-rounded teeth.

Crenulate. Finely crenate.

Cuneate. Shaped like a wedge.

Cuspidate. Tipped with a sharp rigid point, called a cusp.

Cylindric. Shaped like a cylinder.

Cyme. A convex or flat flower-cluster the central flowers unfolding first.

Cymose. Cyme-like, or bearing cymes.

Deciduous. Not persistent; falling away at the close of the growing period.

Decumbent. Stems in a reclining position, but with the end ascending.

Dehiscent. Opening to discharge the contents.

Deltoid. Triangular.

Dense. Crowded closely together.

Dentate. Toothed, with the teeth projecting outwardly.

Denticulate. Minutely dentate.

Depressed. Flattened from above.

Dichotomous. Forking regularly into 2 nearly equal divisions.

Diffuse. Widely or loosely spreading.

Dilated. Distended, inflated.

Dioecious. Having staminate flowers on one plant and the pistillate on another of the same species.

Disk. An enlargement of, or extension of, the receptacle of a flower around the base of the pistil.

Distinct. Separate from each other.

Divergent. Turning in different directions.

Down. Soft pubescence.

Downy. Having soft pubescence.

Drooping. Inclining downwards.

Drupe. A fleshy fruit with a pit or stone such as the peach, plum or cherry.

Drupelet. A small drupe.

Ellipsoid. A solid each plane section of which is an ellipse or a circle.

Elliptic. Having the outline of an ellipse, oval.

Elongated. Drawn out in length.

Entire. Without divisions, lobes or teeth.

Epigynous. Growing on the summit of the ovary, or apparently so.

Erect. Upright, perpendicular to the ground.

Erose. Margin irregular, as if gnawed.

Exfoliating. Peeling off in layers, as the bark of certain shrubs and trees.

Expanded. Spread out; the condition of a flower or leaf in full perfection.

Exserted. Projecting past the surrounding parts, as the stamens from the corolla.

Family. A group of related plants, usually several genera that resemble each other in prominent characteristics. A single genus however if it differs sufficiently may constitute a family.

Fertile. Capable of bearing fruit; bearing seed.

Fibrous. Having much woody fibre.

Filament. A stalk; the part of the stamen which supports the anther.

Filiform. Thread-like; long and slender.

Fleshy. Consisting of pulp; succulent.

Floccose. Having loose tufts of wool-like hairs.

Foliaceous. Leaf-like; similar to leaves.

Foliate. Having leaves.

- Follicle*. A dry one-carpel fruit, opening only on one side.
- Forked*. Separating into two divisions more or less apart.
- Free*. Not joined to other parts.
- Fringed*. Bordered with hair-like appendages.
- Fruit*. The seed-bearing product of a plant of whatever form.
- Funnel-form*. Shaped as a funnel.
- Genus*. A group of species resembling each other so distinctly that a relationship is indicated.
- Germinate*. Sprout; to begin to develop into a higher form.
- Gibbous*. Swollen or enlarged on one side.
- Glabrate*. Without hairs, or nearly so.
- Glabrous*. Entirely smooth; not pubescent or bearing hairs of any kind.
- Gland*. A small appendage or projection; a structure secreting resin, oil, etc.
- Glandular*. Gland-like, or bearing glands.
- Glaucous*. Covered with a fine bluish or whitish bloom.
- Globose*. Spherical or nearly so, globular.
- Glutinous*. Glue-like, sticky.
- Habitat*. The situation in which a plant grows naturally.
- Hair*. An outgrowth of the epidermis, either of one or several cells.
- Head*. A dense cluster of sessile or nearly sessile flowers.
- Herb*. A plant without a persistent woody stem; one that dies annually, at least down to the ground.
- Herbaceous*. Herb-like.
- Hip*. The fleshy ripened fruit of the rose.
- Hirsute*. Bearing rather coarse, stiff hairs.
- Hispid*. Bearing bristles, or beset with rigid hairs.
- Hoary*. Grayish-white with a fine pubescence.
- Hooded*. Having a concave expansion of an organ resembling a hood.
- Hooked*. Curved or bent back at the tip.
- Hybrid*. A cross between two species.
- Imbricated*. Overlapping, as the shingles of a house.
- Impressed*. Furrowed, or hollowed as if by force.
- Incised*. Cut sharply and irregularly into lobes.
- Included*. Not extending beyond the surrounding parts.
- Inferior*. Below or lower; as an inferior ovary, which is attached below the calyx.
- Inflated*. Puffed out; bladdery.
- Inflorescence*. The flowering portion of a plant.
- Inserted*. Growing out of or attached to, as stamens inserted on the corolla tube.
- Interrupted*. Broken or separated.
- Involucre*. A whorl of leaves or bracts surrounding a flower or flower cluster.
- Involute*. Rolled inward.
- Irregular*. Applied to a flower in which one or more of its parts of the same kind are not alike, as when the petals are different.
- Jointed*. Two or more parts joined together, articulated.
- Juice*. The liquid contents of any plant tissue.
- Keel*. The two fused lower petals of the flower of the pea family.
- Lanceolate*. Long and narrow, tapering upward from the middle or below; lance-
- Lateral*. Arising or proceeding from the side.
- Lax*. Loose, not firm or tense.
- Leaf*. A lateral organ borne by the stem, usually flat and green in color.
- Leaflet*. One of the divisions of a compound leaf.
- Leathery*. Tough, resembling leather.
- Legume*. A simple dry fruit, opening along both sides, as in pea and bean pods.
- Lenticels*. A corky pore in the stem of a woody plant.
- Lenticular*. Shaped like a double convex lens.
- Lepidote*. Bearing small, scurfy scales.
- Limb*. The expanded part of a petal, sepal or of a corolla with united petals.
- Linear*. Long and narrow with the sides nearly parallel.
- Lip*. The upper and lower divisions of an irregular corolla or calyx, as in the mints.
- Lobe*. Rounded division of any organ, as of leaves, stigmas, petals, etc.
- Lobed*. Divided into lobes.
- Lustrous*. Bright, shining; having lustre.
- Margin*. The border or edge, as of a leaf.
- Mat*. Closely intertwined vegetation.
- Membranous*. Thin, papery; like a brane.
- Midrib*. The central vein of a leaf.
- Milky*. With opaque white juice.
- Minute*. Exceedingly small.

Monoeious. Having stamens and pistils on the same plant, but in different flowers.

Mucro. A sharp and small abrupt point.

Mucronate. Having a sharp, abrupt point.

Mucronulate. Tipped with a very small point.

Naked. Without enveloping organs or parts.

Nerve. An unbranched vein of a leaf.

Nodul. Pertaining to a node.

Nodding. Bending downward, as hanging on a bent peduncle or pedicel.

Node. The joint of a stem; the part that normally bears a leaf or leaves.

Notched. Nicked, indented.

Nut. A dry, one-seeded non-opening fruit with a hard, bony shell or covering.

Nutlet. A small nut.

Obcordate. Inverted heart-shaped.

Ob lanceolate. Reversed lance-shaped, widest above the middle.

Oblique. Having the sides unequal, slanting.

Oblong. Considerably longer than broad and having nearly parallel sides.

Obovate. Inversely ovate.

Obovoid. Inversely ovoid.

Obsolete. Not evident; rudimentary, gone.

Obtuse. Having the end blunt or rounded.

Opposite. Arranged in pairs, as leaves directly across from each other at the same node.

Orbicular. Circular in outline.

Oval. Broadly elliptical.

Ovary. The part of the pistil that contains the ovules.

Ovate. Having the shape of a longitudinal section of a hen's egg in outline.

Ovoid. Egg-shaped.

Ovule. The rudimentary seed as found in the flower.

Palmate. Having the appearance of an open hand, with the fingers spread, as a leaf with the leaflets arising from a common center.

Palmately. In a palmate manner.

Panicle. A loose, compound, racemose flower cluster.

Paniculate. Resembling a panicle; borne in a panicle.

Parted. Deeply cut.

Pedate. Palmately divided or parted.

Pedicel. The stem of a single flower in a flower cluster.

Peduncle. Stem or stalk of a cluster of flowers, or a single flower.

Pellucid. Transparent, clear.

Pendulous. Hanging.

Perennial. Lasting year after year.

Perfect. Flowers with both stamens and pistils.

Perfoliate. With the leaf clasping the stem so that the stem appears as though passing through it.

Perianth. The floral envelopes, sepals and petals, considered together, whatever their form.

Persistent. Remaining attached after the growing period.

Petal. One of the divisions of the corolla.

Petiole. The stalk or stem of a leaf.

Petiolule. The stalk or stem of a leaflet.

Pilose. Having long, soft hairs.

Pinnate. Leaves divided into leaflets or segments along a common axis.

Pinnatifid. Pinnately cleft.

Pistil. The seed-bearing organ of a flower, the ovary, stigma and style when present.

Pistillate. With pistils, but without stamens.

Pith. The soft, spongy tissue in the center of the stems and branches of certain plants, as the elder.

Pitted. Having small depressions.

Pod. A dry dehiscent fruit.

Pollen. The fertilizing grains contained in the anthers.

Pollination. The transfer of pollen from the anther to the stigma.

Polygamo-dioecious. With perfect and imperfect flowers on different plants.

Polygamo-monoecious. With the perfect and imperfect flowers on the same plant.

Polygamous. Referring to plants bearing pistillate, staminate and perfect flowers.

Pome. A fleshy fruit of which the apple is a typical example.

Prickle. A sharp needle-like growth from the bark or rind.

Primary. The main divisions; of the first rank.

Procumbent. Lying upon the ground or trailing, but not rooting at the nodes.

Prostrate. Lying flat upon the ground.

Protruding. Exserted; thrust out.

Puberulent. Minutely pubescent.

Pubescent. Covered with soft hairs, downy.

- Pulpy*. Soft, succulent.
- Punctate*. Dotted with depressions, or translucent dots or pits.
- Pyramidal*. Having the shape of a pyramid.
- Raceme*. A more or less elongated cluster of pediceled flowers borne upon a common axis.
- Racemose*. Resembling a raceme, or in racemes.
- Rachis*. The axis of a compound leaf, spike or raceme.
- Rank*. A row.
- Rays*. One of the branches of an umbel. The marginal flowers of an inflorescence when distinct from the disk.
- Receptacle*. The end of the flower stalk bearing the floral parts.
- Recurving*. Curved downward or backward.
- Reflexed*. Bent sharply backward.
- Regular*. Having all the members of each part alike in size and shape.
- Reniform*. Shaped like a kidney.
- Resinous*. Having resin.
- Reticulate*. Arranged in the form of network; net-veined.
- Retorse*. Facing backward or downward.
- Revolute*. Rolled backward from the edge.
- Rhizome*. An underground stem.
- Rhombic*. More or less in the shape of a diamond.
- Rib*. A prominent vein of a leaf.
- Ridge*. An elevated line.
- Rigid*. Tending to be stiff.
- Root*. The underground part of a plant which supplies it with nourishment.
- Rootlet*. A very slender root; the branch of a root.
- Rostrate*. Bearing a beak.
- Rotate*. Flat and circular in outline; wheel-shaped.
- Rugose*. Roughened; wrinkled.
- Rusty*. Having the color of iron rust.
- Salver-shaped*. Having a slender tube abruptly expanded into a flat top.
- Samara*. A simple indehiscent winged fruit.
- Sap*. The juice of a plant.
- Scabrate*. Rough or roughened.
- Scabrous*. Rough to the touch.
- Scale*. A minute rudimentary leaf.
- Scaly*. Bearing scales.
- Scar*. The mark left on the stem by the separation of the leaf.
- Scarious*. Thin, dry and membranaceous; not green.
- Scurfy*. Having minute scales.
- Seed*. The ripened ovule.
- Segment*. One of the divisions of a leaf or other organ.
- Sepal*. One of the divisions of a calyx.
- Serrate*. Having teeth pointed forward.
- Serrulate*. Finely serrate.
- Sessile*. Without a stalk or stem.
- Sheath*. A tubular envelope, as the portion of the leaf base that clasps the stem.
- Shoot*. New growth, as a young branch or sucker of a plant.
- Shreddy*. In small irregular strips.
- Silky*. Covered with close-pressed soft and straight pubescence.
- Simple*. All in one piece; not compound, as a leaf.
- Single*. As opposed to double.
- Sinuate*. Having the margin wavy.
- Sinus*. The space between two lobes.
- Skin*. The thin external covering, as of fruit.
- Smooth*. Without pubescence or other roughness.
- Solitary*. Single, only one from the same place.
- Sordid*. Dirty in color; not pleasant.
- Spatulate*. Having the shape of a spatula; oblong with an attenuate base.
- Species*. A group of like individuals.
- Spherical*. Shaped like a sphere; globular.
- Spicate*. Resembling a spike.
- Spike*. An elongated cluster of flowers which are sessile or nearly so on the common axis.
- Spine*. A sharp woody outgrowth from the stem.
- Spiral*. As though wound around an axis.
- Stalked*. Borne on a stalk.
- Stamen*. The part of the flower that bears the pollen grains.
- Staminate*. Bearing stamens, but without pistils.
- Standard*. The large upper petal of a flower of the pea family.
- Stellate*. In the shape of a star.
- Stem*. The main body or stalk of a plant.
- Sterile*. Without seed; unproductive, as a flower without a pistil.

Stigma. That portion of the pistil which receives the pollen to accomplish fertilization.

Stipel. A stipule of a leaflet.

Stipulate. Having stipules.

Stipule. Appendages at the base of the petiole, sometimes attached to it.

Stolon. A basal branch rooting at the nodes.

Stone. The hard, bony seed of some fruits, as the cherry, plum, etc.

Style. The portion of the pistil connecting the stigma and the ovary.

Sub. Latin prefix denoting a lower degree; nearly.

Subcordate. Somewhat heart-shaped.

Subglobose. Somewhat globe-shaped.

Subsessile. Almost sessile.

Subtend. To extend under, or be opposite to.

Subulate. Awl-shaped.

Tawny. A dull brownish-yellow color.

Teeth. The projections of various shapes and sizes along leaf margins.

Tendril. A slender coiling organ of a plant that attaches itself to another body, supporting the plant in climbing.

Terete. Circular in cross section.

Terminal. Borne at the end of a stem or branch, as a flower cluster.

Throat. The opening of a corolla having its petals united.

Tomentose. Densely covered with tomentum.

Tomentulose. Only slightly tomentose.

Tomentum. Dense woolly matted hairs.

Toothed. Having teeth, as the margin of a leaf.

Trailing. Creeping along the ground.

Trifoliate. Having three leaflets.

Truncate. Ending with a nearly straight edge, as if cut off squarely.

Trunk. The main stem.

Tube. Any elongated hollow part or organ, as a corolla or calyx having the segments united.

Tuberculate. Having rounded projections.

Tubular. In the form of a tube.

Tufts. A bunch of small, elongated, flexible parts held together at the base, as hairs in the axil of a leaf-vein.

Twig. A small shoot or branchlet of a shrub.

Twining. Winding spirally.

Umbel. A flower cluster with all the pedicels arising from the same point.

Umbellate. In, or like an umbel.

Unarmed. Without thorns, spines or prickles.

Undulate. Having a wavy margin, or surface.

Unequal. Of different lengths; not alike.

Urceolate. Having the shape of an urn; hollow and cylindrical and contracted below the mouth.

Valvate. Meeting by the edges and not overlapping; opening by valves.

Valve. One of the parts into which a capsule splits.

Variable. Not constant in appearance; changeable.

Vein. Threads of fibro-vascular tissue in a leaf or other organ.

Verticillate. Whorled; arranged in a whorl.

Villous. With long, soft unmatted hairs.

Vine. Any trailing or climbing stem or runner.

Viscid. Glutinous; sticky.

Warty. Bearing warts or hard, firm excrescences.

Wavy. The undulatory edge or surface, as the margin of a leaf.

Whorl. A group of three or more leaves or similar organs arranged in a circle around a stem, and arising about the same point on the axis.

Whorled. Borne in a whorl.

Wing. Any thin expansion surrounding an organ, or bordering it.

Winged. Bearing a wing.

Woody. Approaching the nature of wood.

Woolly. Having a growth of long wool-like hairs.

Bibliography

* Items marked with an asterisk have been abstracted for local distribution records.

- ASHE, W. W.
1902 New East American thorns Jour. Elisha Mitchell Sci. Soc., 18th yr., Pt. 1st., pp. 17-28.
- BAILEY, L. H.
1933 How plants get their names. Macmillan Co., New York. Pp. 209.
- BEAL, W. J.
*1904 Michigan flora: a list of the fern and seed plants growing without cultivation. 5th Rept., Mich. Acad. Sci., pp. 1-147.
*1908 Additions to the Michigan flora. 10th Rept.; *ibid.*, pp. 85-89.
- BILLINGTON, CECIL
*1924 The flowering plants and ferns of Warren Woods, Berrien County, Michigan. Papers, Mich. Acad. Sci. Arts and Lett., Vol. 4, pp. 81-110.
*1929 The flora of two acres of farm land in Oakland County, Michigan. *Ibid.*, Vol. 11, pp. 51-73.
- BINGHAM, MARJORIE T.
*Flora of Oakland County, Michigan. Manuscript to be published as a Bulletin of the Cranbrook Inst. of Science.
- BRITTON, NATHANIEL LORD, AND BROWN, ADDISON
1936 An illustrated flora of the northern United States, etc. 2nd Ed. 3 vols. Pp. 680, 735, 637.
- BROWN, CLAIR A.
*1937 Ferns and flowering plants of Isle Royale, Michigan. U. S. Dept. Interior, National Park Service. Pp. 90.
- CLARK, HUBERT LYMAN
*1901 Notes on the flora of Eaton County. 3rd. Rept.; Mich. Acad. Sci., pp. 51-52.
- COLE, EMMA J.
*1901 Grand Rapids flora. Published by the author. Grand Rapids. Pp. 170.
- COLEY, MAY, AND WEATHERBY, CHARLES ALFRED
1915 Wild flower preservation. Frederick A. Stokes Co., New York. Pp. 197.
- COOPER, WILLIAM S.
*1914 A catalog of the flora of Isle Royale, Lake Superior. 16th Rept., Mich. Acad. Sci., pp. 109-131.
- DACHINOWSKI, ALFRED
*1907 Flora of the Marquette Quadrangle. 9th Rept., Mich. Acad. Sci., pp. 88-97.
- DANIELS, FRANCIS POTTER
*1902 Ecology of the flora of Sturgis, Michigan and vicinity. 4th Rept., *ibid.*, pp. 145-159.
*1902 The flora of the vicinity of Manistee, Michigan. *Ibid.*, pp. 125-144.
- DARLINGTON, HENRY T.
*1920 Contributions to the flora of Gogebic County, Michigan. Pt. 1. 22nd Rept., *ibid.*, pp. 147-176.
*1921 Contributions to the flora of Gogebic County, Michigan, Pt. 2. Papers, Mich. Acad. Sci. Arts and Lett., Vol. 1, pp. 74-82.
*1937 Vegetation of the Porcupine Mountains, Northern Michigan, Pt. 2. *Ibid.*, Vol. 22, pp. 33-68.
- DAVIS, C. A.
*1898 A contribution to the knowledge of the flora of Tuscola County, Michigan. Bot. Gazette, pp. 454-458.
*1900 Botanical notes on Huron County, Michigan. Geol. Sur. of Mich., Vol. 7, Pt. 2, pp. 234-245.
- DEAM, CHARLES C.
1924 Shrubs of Indiana. Ind. Dept. Conservation, Publ. 44. Pp. 351.

DODGE, CHARLES KEENE

- *1899 Flora of St. Clair County, Michigan. 29th Ann. Rept., Mich. Horticultural Soc., pp. 231-314.
- *1911 Results of the Mershon Expedition to the Charity Islands, Lake Huron. 13th Rept., Mich. Acad. Sci., pp. 173-190.
- *1913 The flowering plants, ferns and their allies of Mackinac Island. 15th, *ibid.*, pp. 218-237.
- *1918 Observations on the flowering plants, ferns and fern allies growing wild in Marquette County, Michigan in 1916 and 1917, especially in the vicinity of the Huron Mountain Club. Univ. Mich., Museum Zool. Pubs. No. 5. Pp. 43.
- *1921 Observations on the flowering plants, ferns and fern allies growing wild in Schoolcraft County and vicinity in the Upper Peninsula of Michigan in 1915. Mich. Geol. and Biol. Survey, Pub. 31, Biol. Ser. 6, pp. 75-123.
- *1921 Observations on the flowering plants, ferns and fern allies growing without cultivation in Tuscola County, Michigan. *Ibid.*, pp. 165-222.
- *1921 Observations on the flowering plants, ferns and fern allies on and near the shore of Lake Huron from Linwood Park near Bay City, Bay County, to Mackinaw City, Cheboygan County, including the vicinity of St. Ignace, Mackinac and Bois Blanc Islands, Mackinaw County, Michigan. *Ibid.*, pp. 15-74.
- *1921 Observations on the wild plants at Whitefish Point and Vermillion, near the South Shore of Lake Superior, and other parts of Chippewa County, Michigan, in 1914. *Ibid.*, pp. 125-164.

EMERSON, GEORGE B.

- 1894 A report on the trees and shrubs growing naturally in the forests of Massachusetts. Little Brown & Co., Boston. 2 vols. Pp. 624.

ERLANSOHN, EILEEN WHITEHEAD

- 1926 The wild roses of the Mackinac region of Michigan. Papers Mich. Acad. Sci. Arts. Lett. for 1925, Vol. 5, pp. 77-94.
- 1928 Ten new American species and varieties of *Rosa*. *Rhodora*, Vol. 30, pp. 109-121.

FARWELL, OLIVER ATKINS

- *1900 A catalog of the flora of Detroit. 2nd Rept., Mich. Acad. Sci., pp. 31-68.
- *1904 Contributions to the botany of Michigan, No. 8. 6th Rept., *ibid.*, pp. 200-214.
- *1913 The flora of Parkdale Farm, with special reference to Stony Creek Valley. Contributions to the Botany of Michigan, No. 9. 15th Rept., *ibid.*, pp. 150-192.
- 1915 Contributions to the botany of Michigan, No. 14. 17th Rept., *ibid.*, pp. 167-182.
- *1918 Notes on the Michigan flora, I. 20th Rept., *ibid.*, pp. 161-195.
- *1919 Notes on the Michigan flora, II. 21st Rept., *ibid.*, pp. 345-371.
- *1921 Notes on the Michigan flora, Part IV. Papers, Mich. Acad. Sci. Arts Lett., Vol. 1, pp. 85-100.
- *1922 Notes on the Michigan flora, Part V. *Ibid.*, Vol. 2, pp. 11-46.
- *1923 Notes on the Michigan flora, Part VI. *Ibid.*, Vol. 3, pp. 87-109.
- *1925 Botanical gleanings in Michigan, II. Amer. Midl. Naturalist, Vol. 9, No. 7, pp. 259-282.
- *1927 Botanical gleanings in Michigan, III. *Ibid.*, Vol. 10, No. 1, pp. 19-48.
- *1927 Botanical gleanings in Michigan, IV. *Ibid.*, Vol. 10, No. 7, pp. 199-219.
- 1930 Botanical gleanings in Michigan, VII. *Ibid.*, Vol. 12, pp. 44-78.
- *1937 Notes on the Michigan flora, VII. Papers, Mich. Acad. Sci. Arts Lett., Vol. 23, pp. 123-139.
- *1940 Notes on the Michigan flora, VIII. *Ibid.*, Vol. 26, pp. 3-20.

GATES, FRANK C.

- *1912 The vegetation of the region in the vicinity of Douglas Lake, Cheboygan County, Michigan, 1911. 14th Rept., Mich. Acad. Sci., pp. 46-106.

GATES, F. C. AND EHLERS, J. H.

- *1925 An annotated list of the higher plants of the region of Douglas Lake, Michigan. Papers, Mich. Acad. Sci. Arts Lett., Vol. 4, part 1, pp. 183-284.
- *1928 Additions to an annotated list of the higher plants of the region of Douglas Lake, Michigan, I. *Ibid.*, Vol. 8, pp. 111-120.
- *1931 Additions to an annotated list of the higher plants of the region of Douglas Lake, Michigan, II. *Ibid.*, Vol. 13, pp. 67-88.

- GLEASON, H. A.
1935 Plants of the vicinity of New York. N. Y. Bot. Garden, New York, Pp. 198.
- GRAY, ASA
1887 Gray's lessons in botany, American Book Co., New York. Pp. 226.
- HARNED, JOSEPH E.
1931 Wild flowers of the Alleghanies. Published by the Author, Oakland, Md. Pp. 670.
- HEDRICK, U. P.
1908 The Grapes of New York. State of N. Y. Dept. Agric., 15th An. Rept., Vol 3, Pt. 2. Pp. 564.
1911 The plums of New York. State of N. Y. Dept. Agric., 18th An. Rept., Vol. 3, Pt. 2. Pp. 616.
- HOUGH, ROMEYN BECK
1924 Handbook of the trees of the Northern States and Canada. East of the Rocky Mountains, Romeyn B. Hough, Co., Lowville, N. Y. Pp. 470.
- JACKSON, BENJAMIN DAYDON
1916 A glossary of botanic terms. Duckworth & Co. London and Lippincott's, Philadelphia. Pp. 428.
- KEELER, HARRIET L.
1928 Our northern shrubs, Scribner's, New York. Pp. 521.
- LINNAEUS, CARL.
1753 Species plantarum. Holmiae, 2 vols. Pp. 1230.
- MATHEWS, F. SCHUYLER
1915 Field book of American trees and shrubs. Putnam's, New York. Pp. 465.
- MUENSCHER, W. C.
1936 Keys to the woody plants. Published by the author at Cornell Univ., Ithaca, N. Y. Pp. 105.
- NEWHALL, CHARLES S.
1893 The shrubs of northeastern America. Putnam's, New York. Pp. 249.
- OTIS, CHARLES HERBERT
1931 Michigan trees, 9th Ed. Univ. Mich., Ann Arbor. Pp. 362.
- ROBINSON, BENJAMIN LINCOLN AND FERNALD, MERRITT LYNDON
1908 Gray's new manual of botany, 7th Ed. Amer. Book Co., New York. Pp. 926.
- ROSHDAHL, CARL OTTO AND BUTTERS, FREDERIC
1928 Trees and shrubs of Minnesota. Univ. Minn. Press, Minneapolis. Pp. 385.
- SARGENT, C. S.
1907 *Crataegus* in Southern Michigan. Rept. State Bd. Geol. Survey, Mich., 1906, pp. 515-565.
- STEARNS, FRANCES L.
*1905 A study of plants in ravines near Adrian. 7th Rept., Mich. Acad. Sci. pp. 68-72.
- SUTTON, JOHN M.
*1917 Flora of the Detroit Zoological Tract. 19th Rept., *ibid.*, pp. 263-271.
- WALP, RUSSELL LEE
*1935 Shrubs of Cheboygan and Emmet Counties, Michigan. Amer. Midl. Naturalist, Vol. 16, pp. 230-247.
- WALPOLI, BRANSON A.
*1924 The flora of Washtenaw County, Michigan. Dept. of Natural Science, Mich. State Normal College, Farm and Garden Project Club, Ypsilanti, Michigan. Pp. 80.
- WATERMAN, W. G.
*1922 Development of plant communities of a sand ridge region in Michigan. Bot. Gazette, Vol. 74, No. 1, pp. 1-31.
- WHITNEY, W. D.
*1851 Botany, pp. 359-381. In Foster and Whitney, 'Report on the Geology of the Lake Superior Land District, Part 2'. Washington.
- ZIMMER, GEORGE FREDERICK
..... A popular dictionary of botanical names and terms. George Routledge & Sons, Ltd., London; and Dutton, New York. Pp. 122.

Index

- A**
- Acer*, 153
pennsylvanicum, 152, 153
spicatum, 153, 154
- Aceraceae, 153
- Adenorhachis*, 97
- Alder, 10, 77
 Black, 144
 Dwarf, 155
 Green, 77
 Hoary, 79
 Mountain, 77
 Speckled, 79
- Allspice
 Wild, 83
- Almond
 Flowering, 91
- Alnus*, 77
Alnobetula, 77
crispa, 77, 78
incana, 78, 79
mollis, 77
viridis, 77
- Amelanchier*, 99
oblongifolia, 98, 99
oligocarpa, 25, 100, 101
spicata, 98, 101, 102
- Amorpha*, 133
canescens, 133, 134
- Anacardiaceae, 139
- Andromeda
 Privet, 187
- Andromeda*, 185
glaucophylla, 186, 187
polifolia, 185, 186
- Angelica-tree, 173
- Anonaceae, 81
- Apple, 93, 97
 Custard, Family, 81
- Aquifoliaceae, 144
- Aralia*, 173
spinosa, 172, 173
- Araliaceae, 171
- Arbutus, Trailing, 189
- Arceuthobium*
pusillum, 8
- Arctostaphylos*, 191
Uva-ursi, 191, 192
- Arrow-wood, 221, 227
 Downy, 227
- Ascyrum*, 166
- Ash
 Mountain, 97
- Northern Prickly, 135
 Prickly, 9, 135
 Wafer, 9, 10, 135
- Asimina*, 81
triloba, 25, 80, 81
- Aspen, 55
- B**
- Bayberry, 72
- Bearberry, 191
- Beech Family, 79
- Benzoin*, 83
aestivale, 82, 83
- Berry
 Buffalo, 171
 Buffalo, Canadian, 171
 Salmon, 113
 Service, 99
- Betula*, 75
glandulosa, 76, 77
pumila, 75, 76
 var. *glandulifera*, 75
- Betulaceae, 73
- Bilberry, 193
 Bog, 26, 203
 Dwarf, 26, 203
 Oval-leaved, 205
 Tall, 205
 Thin-leaved, 205
- Birch, 73, 75
 Dwarf, 75
 Low, 75
 Swamp, 75
- Bittersweet, 10
 Climbing, 149
 Shrubby, 149
- Blackberry, 10, 93, 111
 High-bush, 115
 Hispid, 117
 Low Running, 119
 Millspaugh's, 117
 Running Swamp, 117
 Thornless, 117
- Blueberry, 10, 195
 Black High, 201
 Canada, 199
 Dryland, 199
 Early Sweet, 197
 High-bush, 147, 201
 Late Low, 199
 Low Sweet, 197
 Sour-top, 199
 Swamp, 201
 Tall, 201
 Velvet-leaf, 199

INDEX

- Bramble, 111
- Brier
 - Horse, 53
- Buckthorn, 155
 - Alder, 155
 - Family, 155
- Bush
 - Benjamin, 83
 - Burning, 147
 - Fever, 83
 - Pearl, 91
 - Running Strawberry, 149
 - Spice, 10, 83
 - Strawberry, 147
 - Steeple, 95
- Buttonbush, 10, 208
 - Common, 208

C

- Caprifoliaceae, 209
- Cashew Family, 139
- Cassandra, 189
- Ceanothus*, 157
 - americanus*, 156, 157
 - ovatus*, 156, 157
 - var. *pubescens*, 159
- Cedar
 - Red, 103
- Celastraceae, 147
- Celastrus*, 149
 - scandens*, 149, 150
- Cephalanthus*, 208
 - occidentalis*, 206, 208
- Chamaedaphne*, 189
 - calyculata*, 188, 189
- Checkerberry, 191
- Cherry, 10, 93, 129
 - Appalachian, 129
 - Choke, 129
 - Sand, 131

- Chiogenes*
 - hispidula*, 8

- Chokeberry, 97
 - Black, 99
 - Purple, 97
 - Red, 97

- Cinquefoil
 - Shrubby, 91, 109

- Cistaceae, 167

- Clematis*
 - virginiana*, 8

- Club
 - Devil's, 173
 - Hercules, 173

- Cornaceae, 175

- Cornel
 - Silky, 177

- Cornus*, 175
 - alternifolia*, 180, 181
 - Amomum*, 174, 177
 - asperifolia*, 176, 177
 - Baileyi*, 30, 176, 179
 - circinata*, 174, 175
 - paniculata*, 178, 181
 - stolonifera*, 178, 179

- Corylus*, 73
 - americana*, 73, 74
 - avellana*, 73
 - rostrata*, 74, 75

- Cotoneaster, 91

- Cotton-woods, 55

- Cranberry, 195
 - American, 207
 - High-bush, 223
 - Large, 207
 - Mountain, 205
 - Rock, 26, 205
 - Small, 207
 - Tree, 223

- Crataegus*, 12, 102
 - coccinea*, 105, 106
 - crus-galli*, 100, 104
 - mollis*, 107, 108
 - punctata*, 105, 106, 107
 - tomentosa*, 107

- Crowberry, 137
 - Black, 23, 137
 - Family, 137

- Current, 85
 - Skunk, 89
 - Swamp Black, 89
 - Swamp Red, 89
 - Wild Black, 87

D

- Decodon*
 - verticillatus*, 8

- Deerberry, 195

- Dewberry, 119

- Diervilla, 209

- Diervilla*
 - Lonicera*, 209, 210

- Dirca*, 169
 - palustris*, 169, 170

- Dogberry, 85

- Dogwood, 10, 175
 - Alternate-leaved, 181
 - Bailey's, 179
 - Family, 175

INDEX

- Panicked, 181
- Poison, 141
- Red-Osier, 9, 177, 179
- Rough-leaved, 177
- Round-leaved, 175
- Silky, 9

- Elaeagnaceae, 169
- Elder, 9, 10, 231
 - Common, 231
 - Poison, 141
 - Red-berried, 232
- Elderberry, 231
- Empetraceae, 137
- Empetrum*, 137
 - nigrum*, 23, 25, 136, 137
- Epigaea*, 189
 - repens*, 189, 190
- Ericaceae, 182
- Evonymus*, 147
 - americanus*, 147, 148
 - atropurpureus*, 147, 148
 - obovatus*, 149, 150

- Fagaceae, 79
- Fatsia*, 173
 - horrida*, 25, 172, 173
- Fern
 - Sweet, 72
- Filbert, 73
- Foxberry, 193

- Gale
 - Sweet, 72
 - Sweet, Family, 71
- Gaultheria*, 191
 - procumbens*, 190, 191
- Gaylussacia*, 193
 - baccata*, 192, 193
 - forma *glaucocharpa*, 193
 - forma *leucocarpa*, 193
- Ginseng Family, 171
- Gooseberry, 85
 - Missouri, 85
 - Northern, 87
 - Prickly, 85
- Grape, 161
 - Bear's, 193
 - Blue, 163
 - Chicken, 165
 - Concord, 163
 - False, 161
- Frost, 165
- Northern Fox, 161
- Pigeon, 163
- River-bank, 165
- Summer, 163
- Winter, 163
- Greenbrier, 53
 - Common, 53
 - Hispid, 53
- Grossularia*
 - missouriensis*, 87

- H
- Hamamelidaceae, 90
- Hamamelis*, 91
 - virginiana*, 91, 92
- Hardhack, 95
- Haw
 - Black, 229
 - Dotted, 105
 - Red, 105
- Hawthorn, 12, 91, 103
- Hazelnut, 10, 73
 - American, 73
 - Beaked, 75
- Heath Family, 182
- Hemlock
 - Ground, 49
- Hobble
 - Witch, 221
- Hobble-bush, 23, 26, 221
- Holly, 144
 - Family, 144
 - Mountain, 145
- Honey Balls, 208
- Honeysuckle, 211
 - American Fly, 213
 - Bush, 209
 - Douglas', 217
 - Family, 209
 - Glaucous, 217
 - Hairy, 215
 - Involucrated Fly, 215
 - Mountain Fly, 211
 - Smooth-leaved, 217
 - Swamp Fly, 213
- Huckleberry, 9, 10, 193
 - Black, 193
 - Blue, 199
 - Squaw, 195
- Hudsonia, 167
 - Woolly, 167
- Hudsonia*, 167
 - tomentosa*, 167, 168
 - var. *intermedia*, 169

INDEX

- Hypericaceae, 166
Hypericum
Kalmianum, 167, 168
prolificum, 164, 166
- I
- Ilex*, 144
verticillata, 144, 146
- Indigo
 False, 133
- Ivy
 Five-fingered, 159
 Poison, 10, 139, 143
 Three-leaved, 143
- Juneberry, 99
 Low, 101
 Oblong-fruited, 101
- Juniper, 9, 10, 49
 Creeping, 51
 Prostrate, 51
- Juniperus*, 49
communis var. *depressa*, 49, 50, 51
horizontalis, 49, 51, 52
- Kalmia*, 29, 183
angustifolia, 183, 184
polifolia, 184, 185
- Kinnikinnik, 177, 193
- Lambkill, 183
- Lauraceae, 83
- Laurel, 83, 183
 Family, 83
 Ground, 189
 Mountain, 185
 Pale, 185
 Sheep, 183
 Swamp, 185
- Leatherleaf, 189
- Leatherwood, 9, 169
- Ledum*, 182
groenlandicum, 180, 182
- Leguminosae, 133
- Liliaceae, 51
- Lily Family, 51
- Linnaea*
borealis, 28
- Lonicera*, 211
caerulea var. *villosa*, 210, 211
canadensis, 212, 213
dioica, 216, 217
- glaucescens*, 216, 217
hirsuta, 214, 215
involuta, 26, 214, 215
oblongifolia, 212, 213
- Lyonia*, 187
ligustrina, 25, 187, 188
- M
- Madder Family, 208
- Malus*, 97
- Maple, 153
 Family, 153
 Mountain, 153
 Striped, 153
- Meadow-sweet, 95
- Mealberry, 193
- Menispermum*
canadense, 8
- Mezereum Family, 169
- Mistletoe
 Dwarf, 8
- Moosewood, 9, 153
- Myrica*, 72
asplenifolia, 70, 72
Gale, 70, 72
- Myricaceae, 71
- Myrtle
 Barren, 193
- N
- Nanny-berry, 229
- Nemopanthus*, 145
mucronata, 145, 146
- Nine-bark, 10, 91, 93
 Common, 93
- Nut
 Bladder, 9, 151
 Bladder, American, 151
 Bladder, Family, 151
- O
- Oak, 79
 Dwarf Chestnut, 23, 79
 Poison, 141, 143
 Scrub, 79
- Oleaster Family, 169
- Papaw, 25, 81
 Common, 81
 North American, 81
- Papilionoideae, 133
- Pears, 97

INDEX

Physocarpus, 93
opulifolius, 92, 93
 var. *intermedius*, 95

Pinaceae, 49

Pine Family, 49

Piroporum, 97

Plant

Lead, 133

Plum, 10, 93, 129

Canada, 131

Red, 132

Wild, 131

Wild Yellow, 132

Poplar, 55

Populus, 55

Potentilla, 109

fruticosa, 108, 109

Prunus, 129

americana, 130, 132

cuneata, 128, 129

nigra, 130, 131

pumila, 128, 131

virginiana, 126, 129

Psedera, 159

quinquefolia, 158, 159

vitacea, 158, 161

Ptelea, 135

trifoliata, 135, 136

Pulse Family, 133

Pyrus

arbutifolia var. *atropurpurea*, 96, 97

melanocarpa, 96, 99

Quaker Lady, 95

Queen-of-the-meadow, 95

Quercus, 79

prinoides, 23, 79, 80

Quince

Japanese, 91

R

Raisin

Wild, 229

Raspberry, 10, 12, 93, 111

Black, 23, 112

Dwarf, 115

Purple Flowering, 113

Wild Red, 111, 112

Red-root, 157

Smaller, 157

Rhamnaceae, 155

Rhamnus, 155

alnifolia, 154, 155

Rhus, 139

canadensis, 142, 144

copallina, 140, 141

glabra, 138, 141

Toxicodendron, 142, 143

var. *radicans*, 144

typhina, 138, 139

Vernix, 140, 141

Ribes, 85

Cynosbati, 82, 85

floridum, 86, 87

gracile, 84, 85

lacustre, 86, 89

Missouriensis, 87

oxyacanthoides, 84, 87

var. *calicicola*, 87

var. *saxosum*, 87

prostratum, 88, 89

triste, 88, 90

var. *albinervium*, 90

Rockrose Family, 167

Rosa, 119

acicularis, 122, 123

blanda, 28, 122, 123

var. *Hermanni*, 121

carolina, 124, 125

humilis, 126, 127

Michiganensis, 121

rubiginosa, 124, 125

Schuetteaana, 121

setigera, 120, 121

Rosaceae, 91

Rose, 10, 12, 119

Climbing, 121

Eglantine, 125

Family, 91

Prairie, 121

Prickly Wild, 123

Meadow, 123

Michigan, 121

Pasture, 127

Smooth, 123

Swamp, 125

Sweetbrier, 125

Rosemary

Bog, 187

Wild, 185

Rubiaceae, 208

Rubus, 111

allegheniensis, 28, 115, 116

canadensis, 117, 118

flagellaris, 119

hispidus, 117, 118

idaeus var. *aculeatissimus*, 110, 111

forma *albus*, 112

occidentalis, 23, 110, 112

forma *pallidus*, 112

odoratus, 113, 114

INDEX

- parviflorus*, 113, 114
triflorus, 115, 116
villosus, 119, 120
 Rue Family, 135
 Rutaceae, 135
- St. John's-wort, 166
 Family, 166
 Kalm's, 167
 Shrubby, 166
 Salicaceae, 55
Salix, 55
 balsamifera, 25, 60, 61
 Bebbiana, 71
 candida, 28, 68, 71
 cordata, 58, 59
 discolor, 62, 65
 glaucophylla, 58, 61
 humilis, 64, 67
 longifolia, 56, 59
 lucida, 54, 57
 myrtilloides, 65
 pedicellaris, 62, 63
 petiolaris, 64, 65
 rostrata, 68, 69
 sericea, 66, 69
 serissima, 56, 59
 syrticola, 60, 63
 tristis, 66, 67
Sambucus, 231
 canadensis, 228, 231
 pubens, 232
 racemosa, 230, 232
 var. *laciniata*, 232
 Sassafras, 83
 Saxifragaceae, 83
 Saxifrage Family, 83
 Shad-bush, 91, 99, 101
 Sheepberry, 229
Shepherdia, 171
 canadensis, 170, 171
 Smelt-bush, 101
Smilax, 53
 hispida, 53, 54
 rotundifolia, 52, 53
 var. *quadrangularis*, 53
 Snapwood, 83
 Snowberry, 219
Solanum
 Dulcamara, 8
Sorbus, 97
- Spikenard, 173
 Spiraea, 10, 92, 95
 Willowleaf, 95
Spiraea, 95
 salicifolia, 94, 95
 tomentosa, 94, 95
 Squashberry, 225
 Staff Tree Family, 147
Staphylea, 151
 trifolia, 151, 152
 Staphyleaceae, 151
 Steeple Bush, 95
 Stick
 Devil's Walking, 173
 Strawberry, 93
 Sumac, 9, 139
 Aromatic, 144
 Dwarf, 141
 Fragrant, 144
 Poison, 9, 10, 141, 147
 Shining, 141
 Smooth, 141
 Staghorn, 9, 139
 Swamp, 141
Symphoricarpos, 219
 occidentalis, 218, 219
 racemosus, 218, 219
- Taxaceae, 49
Taxus, 49, 50
 canadensis, 28, 49
 Tea
 Inland Jersey, 157
 Labrador, 182
 New Jersey, 157
 Teaberry, 191
 Thimbleberry, 113
 Thorn
 Cock-spur, 104
 Downy, 107
 Large-fruited, 105
 Red-fruited, 107
 Scarlet, 105
 Thymelaeaceae, 169
 Tree
 Common Hop, 135
 Staff, Family, 147
 Toothache, 135
 Trefoil
 Shrubby, 135
 Twin-flower, 28

INDEX

Vaccinium, 195
atrococcum, 198, 201
caespitosum, 26, 200, 203
canadense, 196, 199
 forma chiococcum, 199
corymbosum, 198, 201
macrocarpon, 206, 207
membranaceum, 202, 205
ovalifolium, 202, 205
Oxycoccus, 204, 207
 var. intermedium, 207
pennsylvanicum, 194, 197
 var. angustifolium, 197
 var. nigrum, 197
 forma leucocarpum, 197
stamineum, 26, 194, 195
uliginosum, 26, 200, 203
vacillans, 196, 199
Vitis-Idaea var. minus, 26, 204, 205

Viburnum, 221
 Mapleleaf, 225
 Sweet, 229

Viburnum, 10, 221
acerifolium, 222, 225
alnifolium, 26, 220, 221
cassinoides, 226, 229
dentatum, 224, 227
Lentago, 226, 229
Opulus, 225
 var. americanum, 220, 223
pauciflorum, 27, 222, 225
prunifolium, 228, 229
pubescens, 224, 227

Vine Family, 159

Virginia Creeper, 159

Vitaceae, 159

Vitis, 161
aestivalis, 160, 163, 165
bicolor, 162, 163, 165
cordifolia, 162, 165
labrusca, 160, 161
rupestris, 164, 165

W

Wahoo, 147
 Wafer Ash, 9, 10, 135
 Waxwork, 149
 Wicky, 183
 Wicopy, 169
 Willow, 9, 10, 55
 Autumn, 59
 Balsam, 61
 Beaked, 69
 Bebb's, 69
 Bog, 63
 Broad-leaf, 61
 Dwarf Upland, 67
 Family, 55
 Furry, 63
 Glaucous, 65
 Hoary, 71
 Longleaf, 59
 Prairie, 67
 Pussy, 65
 Sage, 67, 71
 Sandbar, 59
 Shining, 57
 Silky, 69
 Slender, 65
 Winterberry, 144
 Wintergreen
 Aromatic, 10, 191
 Witch-hazel, 9, 10, 91
 Common, 91
 Family, 90
 Withe-rod, 229
 Wolfberry, 219
 Woodbine, 159

Y

Yew, 9, 49
 American, 49
 Family, 49

Zanthoxylum, 135
 americanum, 134, 135